AZT

Typical Antiviral

Introduction

AIDS, which stands for acquired immunodeficiency syndrome, is caused by infection with human immunodeficiency virus. HIV is spread from person to person during unprotected sex, through use of contaminated needles, through transfusion of contaminated blood, or from mother to child during birth. The virus eventually destroys the body's ability to fight off infections and certain cancers by disabling immune system cells. Without immune protection, AIDS patients often succumb to bacterial or viral infections that would simply sicken healthy people.

First time AZT was discovered

- By early 1985, Samuel Broder and Hiroaki Mitsuya had demonstrated that AZT, a molecule first synthesized in 1964 by chemist Jerome P. Horwitz of the Michigan Cancer Foundation, prevented HIV from multiplying in cultured human cells.
- Food & Drug Administration agency approved AZT for use against AIDS in early 1987 and began marketing the drug under the trade name Retrovir.

How does AZT work ?

- HIV is the cause of AIDS. Incapable of replicating itself, HIV cleverly tricks the cell it infects into doing the job: The virus first converts its RNA genome into DNA and then inserts this DNA version of its genome into the cell's genome. As a consequence, the cell unwittingly replicates the virus.

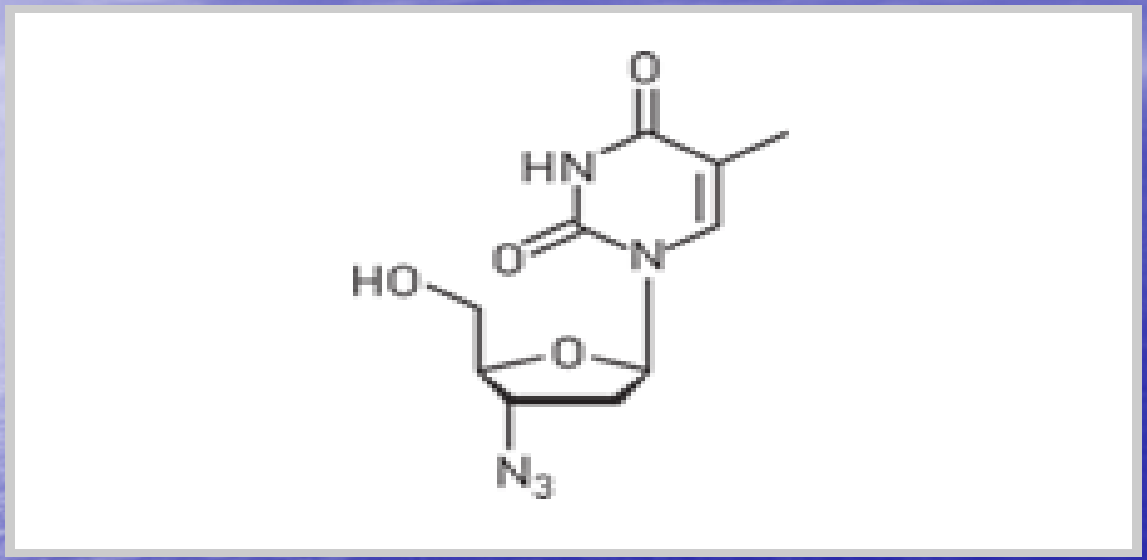
How does AZT work ?

- AZT is an azido analog of thymidine, one of the four building blocks that make up DNA. After being activated by phosphorylation in vivo, AZT inhibits HIV replication by blocking a critical HIV enzyme called reverse transcriptase. This enzyme uses the virus's RNA genome as a template to build a DNA version that can be inserted into the host's genome. Reverse transcriptase incorporates AZT into the growing DNA chain in place of thymine. But because AZT has a 39 azido group instead of a 39 hydroxyl group, it can't make the necessary phosphate bond with the next nucleotide. This terminates the synthesis of the DNA copy of the virus's RNA genome, preventing integration into the host and blocking viral replication.

Sales

- $1.8 billion worldwide in 2004 (AZT and AZT-containing products).

Structure and name of AZT



- 3'-azido-3'-deoxythymidine

Other Names of AZT

- AZT
- Retrovir
- 1-(3-azido-2,3-dideoxy- -D-ribofuranosyl)-5-methylpyrimidine-2,4-(1H,3H)-dione

CAS Registry

- 30516-87-1