NRTIs (Nucleoside Reverse Transcriptase Inhibitors)

NRTIs, or nucleoside reverse transcriptase inhibitors, are a class of antiretroviral drugs used to treat HIV. They work by competitively inhibiting nucleotide binding to reverse transcriptase and also terminate the elongating DNA chain. Certain drugs have specific indications; for example, ZDV is used for general prophylaxis and during pregnancy to decrease transmission. This drug class is notable because they must be "activated" in the cell and require phosphorylation.



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Indications

HIV
AIDS Band-aid
NRTIs are indicated for treating HIV and target reverse transcriptase activity.

Pregnancy and Prophylaxis given ZDV
Pregnant-woman with Purple-axes and Zombie-dove
ZDV, or zidovudine, is a specific NRTI used to provide general prophylaxis as well as for pregnant women who are HIV positive to decrease the risk of fetal transmission.

Mechanism

Inhibit Nucleotide Binding to Reverse Transcriptase
Inhibiting-chains preventing Reversing Train-script from Binding to Nucleotides
NRTIs are a class of drugs that work by competitively inhibiting nucleotide binding to reverse transcriptase. This inhibition prevents the virus from making a DNA copy of its RNA.

Chain Termination
Chain Stop
By binding to the viral reverse transcriptase, these medications lead to elongating DNA (which is viral) chain termination. A lack of a 3'-OH group in the incorporated nucleotide analogue prevents DNA chain elongation, and therefore, the viral DNA growth is terminated.

Require Phosphorylation
Using Phosphorus-P
NRTIs need to become "activated" and require phosphorylation from the host cell.

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