ANTIVIRAL DRUGS

Anti-Influenza Drugs (RNA Virus)

Drug(s)	Mechanism of Action	Clinical Use	Toxicity
Amantadine, Rimantadine	Blocks attachment, penetration, and uncoating of influenza A virus.	Prophylaxis of influenza A (no longer useful due to resistance); adjuvant for anti-Parkinsonian(tolerance)	Nervousness, insomnia, seizures (overdose), atropine-like effects.
Oseltamivir, Zanamivir	Inhibits neuraminidases of influenza A & B, preventing release of viral particles.	Prevention and treatment of influenza A & B.	Not specified.

Anti-Herpetic Drugs (DNA Virus)

Drug(s)	Mechanism of Action	Clinical Use	Toxicity
Acyclovir, Famciclovir, Valacyclovir	Guanosine analogs → phosphorylated to triphosphates → inhibit viral DNA polymerase → chain termination.	Herpes simplex, varicella-zoster virus; prophylaxis in immunocompromised.	Crystalluria, nephropathy (maintain hydration).
Ganciclovir	Phosphorylated by CMV kinase →inhibits DNA polymerase.	Treatment/prophylaxis of CMV (immunocompromised).	Myelosuppression, nephropathy.
Foscarnet	Directly inhibits viral DNA polymerase, RNA polymerase, and HIV reverse transcriptase (no activation required).	Resistant CMV or HSV infections.	Nephrotoxicity, electrolyte imbalances → seizures.

Anti-HIV Drugs

A. Fusion Inhibitors

Drug(s)	Mechanism of Action	Toxicity
Enfuvirtide	Binds gp41 (viral) → blocks viral and cellular membrane fusion.	Injection site reaction, hypersensitivity, bacterial pneumonia.
Maraviroc	Binds CCR5 (host receptor) → prevents virus entry into CD4+ cells.	Cough, diarrhea, muscle/joint pain.

B. Reverse Transcriptase Inhibitors (RTIs)

Drug(s)	Mechanism of Action	Clinical Use and notes	Toxicity
NRTIs **(Zidovudine, lamivudine didanosine, tenofovir)**	Phosphorylated by host kinases → inhibit reverse transcriptase → DNA chain termination.	Core HAART component; **vertical transmission prophylaxis**. Crosses BBB execrated by liver	Bone marrow depression (reversed by **G-CSF** and **erythropoietin**), peripheral neuropathy, lactic acidosis.
NNRTIs **(Efavirenz, etravirine)**	Bind reverse transcriptase (non-competitive) → inhibit DNA synthesis.	Part of HAART regimens. Contra indicated in pregnancy	Rash, hepatotoxicity; (Efavirenz, **vivid dreams**, contraindicated in pregnancy).

C. Integrase Inhibitors

Drug(s)	Mechanism of Action	Notes
Raltegravir, Elvitegravir	Inhibit integration of viral genome into host DNA.	Used as part of HAART (2 NRTIs + another agent).

D. Protease Inhibitors (PIs)

Drug(s)	Mechanism of Action	Toxicity
Atazanavir, Lopinavir, Ritonavir	Inhibits HIV protease → prevents viral maturation.	Hyperglycemia, lipodystrophy, nausea, diarrhea, drug-drug reaction (because they inhibit CYP450)

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