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 Parkinsonism(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; vivid dreams (Efavirenz, 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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