

Source: [KBBiologyMasterIndex](#)

1 | Overview of Human Diseases

A lecture by the Legendary Dr. Paul Hauser. Slides are here

#flo #disorganized

Preventing Retroviruses

- Prevent Fusion gp120, gp41, CCR5
- Prevent reverse transcription RT
- Prevent intergration via intergrease IN
- Prevent viron maturation PR

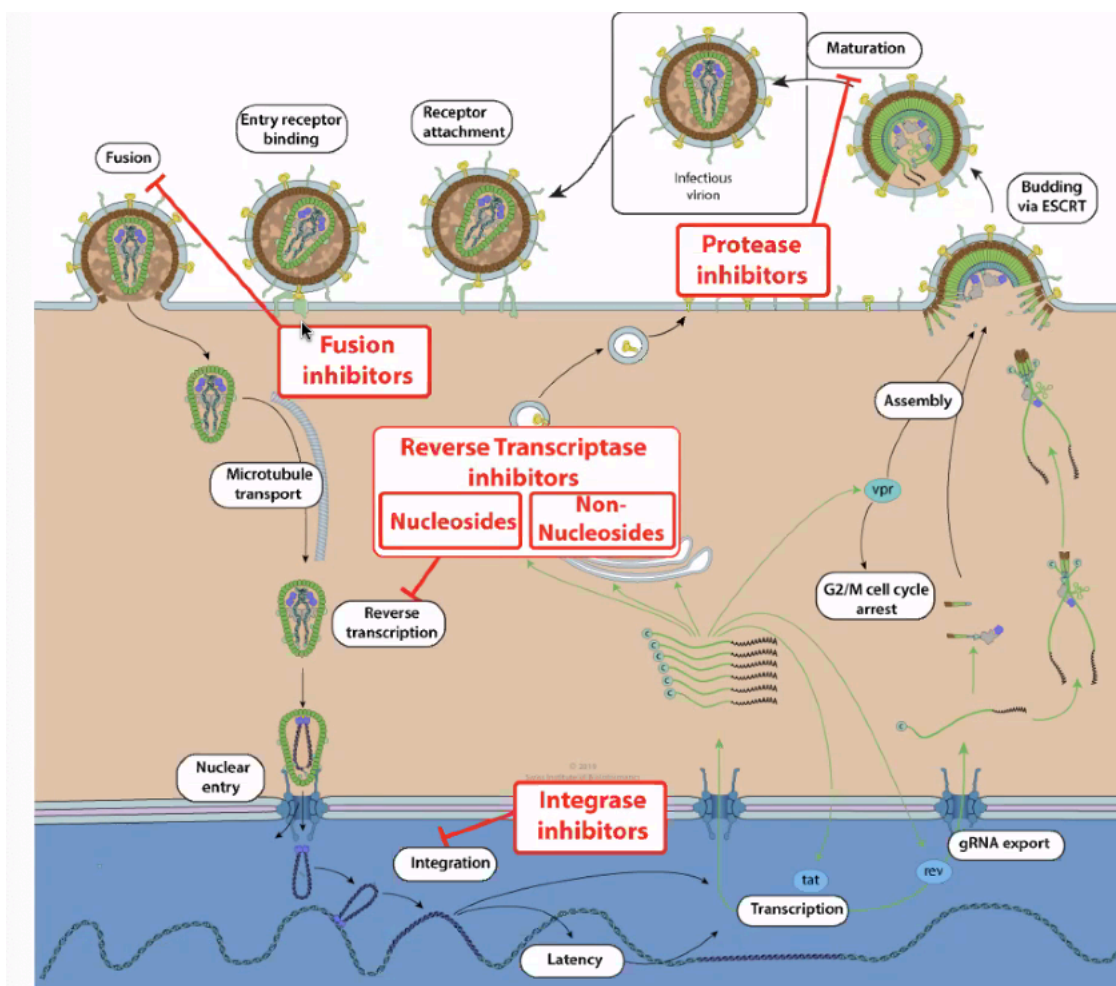


Figure 1: stophiv.png

- Most advanced: HAART (Highly-Active Anti-Retroviral Therapy)
 - Cocktail drug works together for inhibition
 - Two drugs to stop intergration, one to stop protease (viron maturation)
 - Could develop resistance

1.0.1 | Viral Genome vs Mutation Rate

Viral genome size vs. mutation rate



Figure 2: Screen Shot 2020-10-12 at 11.24.39 PM.png

- RNA viruses could mutate more because it does not have checks
- More complex+largest viruses harder to mutate

Genetic drift — viruses mutate due to polymerase error

Genetic shift — viruses recombine without mutating by crossing-over mechanism or genome segment reassortment. Think! the flu

1.1 | Why are viruses bad

Damage host cells/tissues by...

- Reducing gene expression capacity
- Depleting cellular resources
- Causing cell lysis (to explode)
- Promoting tumorigenesis — cancer
- Creating damaging immunological response

1.2 | Preventing Viruses

Let's talk about **Remdesivir**! A drug developed by Pfizer that's used to combat Ebola + influenza viral replication.

Modified nucleotide triphosphate which adds onto the RNA strand copied by the RNA-Dependent RNA Polymerase carried by viruses

- Pretends + gets inserted as a nucleotide
- Once added onto the RNA chain, jams further actual nucleotides from being inserted

Could but usually does not jam up normal RNA polymerase which does normal transcription

- Inhibiting transcription in the short term won't kill you immediately
- So, we hurt normal cell transcription a little in order to rid of the virus
- Need hospital treatment for regular and safe dosing for this exact reason
- Viral proteins are usually easy to assemble

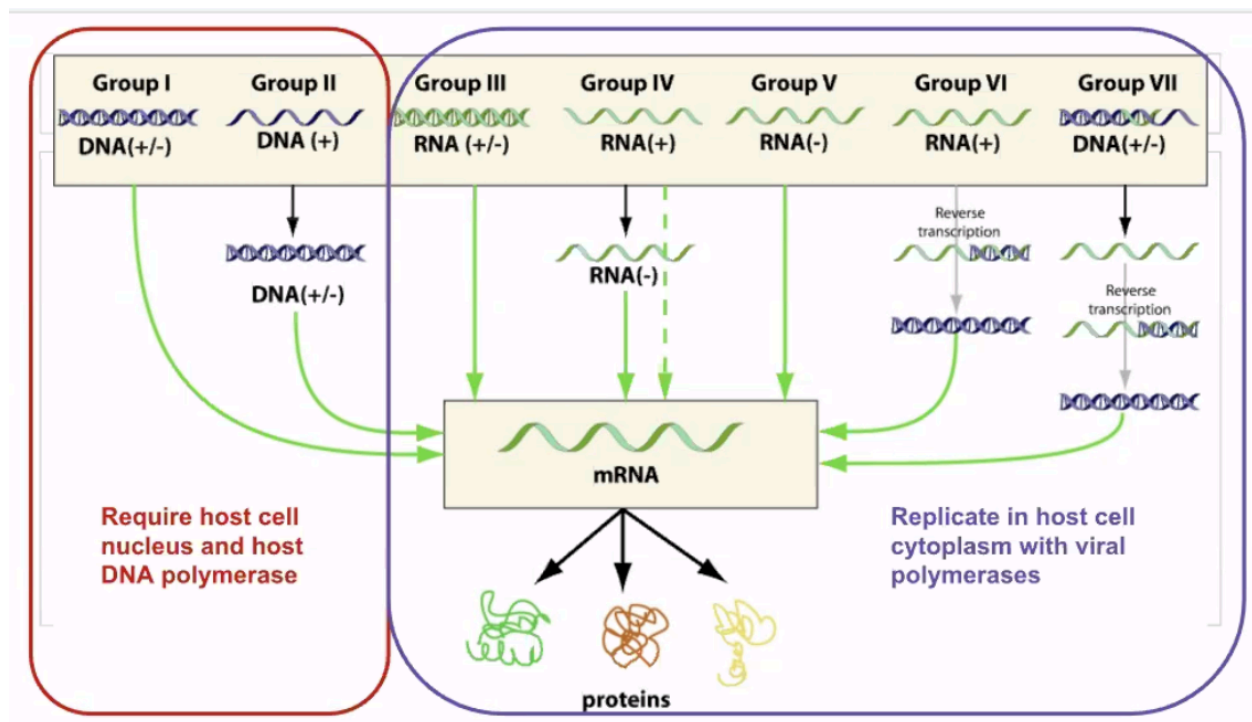


Figure 3: Screen Shot 2020-11-02 at 2.48.22 PM.png

Question: how are proteins made in the viral genome

- No viruses produce ribosomes
- Ribosomes become centrally important for the virus
- What serves as the template to make new virus copies

Viruses attempt to overwhelm the enzyme to entry.

DNA viruses are “less complex”, in that as long as they are able to get into the nucleus, the rest would just be the body's work automatically.