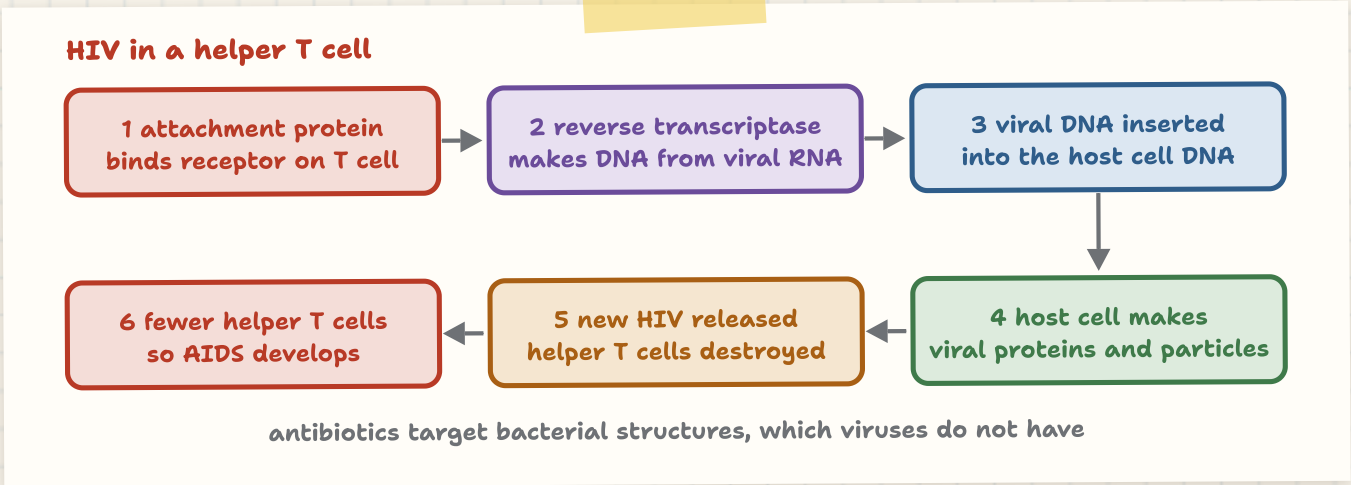
HIV Replication and How It Causes AIDS

HIV binds a helper T cell, uses reverse transcriptase to insert DNA, hijacks the cell to make more virus, and the loss of helper T cells causes AIDS.



Key terms

HIV	a retrovirus with RNA, a capsid, an envelope and attachment proteins; it infects helper T cells.
attachment protein	a protein on HIV that binds to a complementary receptor on the helper T cell.
reverse transcriptase	the enzyme that makes DNA from the viral RNA; this DNA is inserted into the host DNA.
helper T cell	the host cell: HIV destroys it, so fewer B cells and cytotoxic T cells are activated.
AIDS	the condition where the immune system is weakened, leading to opportunistic infections.
antibiotic	kills bacteria by targeting bacterial structures or enzymes; viruses have none (they use the host cell's metabolism).

I can...

- [ ] Structure of HIV and its replication in helper T cells
- [ ] How HIV causes the symptoms of AIDS
- [ ] Why antibiotics are ineffective against viruses

EXAM TRAP

HIV is not AIDS: HIV is the virus, AIDS is the condition caused by the fall in helper T cells. Antibiotics fail because viruses have no target, not because HIV is resistant. HIV needs the host cell to make new particles.

5 marks: what earns them

1. Attachment protein binds to a (complementary) receptor on the helper T cell
   Not: HIV attaches to the cell, with no protein or receptor; binds to white blood cells
2. Reverse transcriptase makes DNA from the viral RNA, and this DNA is inserted into the host cell's DNA
   Not: virus makes its own RNA; reverse transcriptase makes RNA
3. The host cell makes new viral proteins / virus particles, which are released
   Not: the virus replicates itself, with no role for the host cell
4. Helper T cells are destroyed / numbers fall, so the immune system is weakened and the person gets opportunistic infections (AIDS)
   Not: HIV kills the person; HIV is AIDS; destroys all white blood cells
5. Antibiotics do not work on viruses because viruses have no cell wall / metabolism (of their own) for the antibiotic to target
   Not: HIV is resistant to antibiotics; antibiotics are too small; viruses are not alive, with no target stated

Remember

Attach, then RNA to DNA.
DNA in, host cell builds new HIV.
Helper T cells fall, so AIDS.

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