

Viruses **HL only**

Five features common to all viruses

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Structure of bacteriophage lambda

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Structure of a coronavirus

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Structure of HIV

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Stages of the lytic cycle

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What do viruses rely on host cells for?

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What is a prophage?

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What triggers a lambda prophage to enter the lytic cycle?

Double-stranded DNA in an icosahedral protein head on a long tail; not enveloped; infects *E. coli*.

Small, fixed size; DNA or RNA as genetic material; a protein capsid; no cytoplasm; few or no enzymes.

Two copies of single-stranded RNA and reverse transcriptase in a cone-shaped capsid, inside an envelope with glycoproteins.

Single-stranded RNA in a helical capsid, inside an envelope of host membrane with spike glycoproteins.

Energy supply, nutrition, protein synthesis and other life functions.

Attachment, injection of DNA, replication and protein synthesis using host resources, assembly, then lysis and release.

Stress to the host, such as DNA damage by ultraviolet light (induction).

Viral DNA integrated into the host chromosome in the lysogenic cycle, copied each time the host divides.

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Why might the shared features of viruses be convergent evolution?

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Evidence linking viruses to cellular life

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Three reasons some viruses evolve rapidly

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What is antigenic drift?

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Why is HIV treated with a combination of drugs?

The genetic code is shared between viruses and living organisms.

All viruses share extreme obligate parasitism, so similar features may have evolved separately in different lineages.

Gradual mutations change influenza's H and N antigens, so existing antibodies bind less well; the vaccine is updated yearly.

High mutation rates (no proofreading), short generation times and huge numbers of virus particles.

A variant would need resistance to several drugs at once, which is very unlikely.