

Biosafety Clearing-House (BCH)

ORGANISM (ORGA)

BCH-ORGA-SCBD-116142-1

LAST UPDATED: 28 JUN 2021

Organism information

Scientific name

Human immunodeficiency virus 1

Taxonomic Classification

Kingdom Pararnavirae
Phylum Artverviricota
Class Revtraviricetes
Order Orterviraes
Family Retroviridae
Genus Lentivirus
Species Human immunodeficiency virus 1

Common name(s)

HIV-1

EN

Additional classification

Group (virus)

VI

Type of organism

Viruses

Characteristics related to biosafety

Geographical distribution

Worldwide

EN

Known pathogenicity and/or allergenicity

Human immunodeficiency virus 1 is an enveloped, retrovirus that infects humans. The virus is the causal agent of Acquired Immune Deficiency Syndrome (AIDS). CD4+ cells, such as helper T cells, monocytes and macrophages, are the target cell-type for the virus. The infection leads to low levels of CD4+ cells and loss of cell-mediated immunity.

EN

The infection cycle:

- 1) HIV glycoprotein120 (gp120) binds to CD4
- 2) HIV gp41 binds a chemokine co-receptor (generally CCR5 or CXCR4) and fuses with the host cell membrane
- 3) Nucleocapsid is released into the cytoplasm
- 4) Core proteins are removed releasing viral genome (single stranded RNA) and enzymes
- 5) Viral reverse transcriptase synthesizes a DNA copy of the genome
- 6) Ribonuclease H degrades the RNA copy of the genome and a second round of DNA synthesis takes place (yielding double stranded DNA)
- 7) The viral dsDNA is then integrated into the host genome by viral integrase (provirus; latency period begins)
- 8) The provirus is activated and transcription begins
- 9) Viral RNA is exported to the cytoplasm
- 10) Host ribosomes synthesize viral precursor proteins, which will be cleaved by viral protease
- 11) Viral ssRNA and proteins assemble beneath host cellular membrane, which has gp120 and gp41 inserted
- 12) Virus particles bud out of the cell and complete maturation (often causing cell lysis)

Common use(s)

Research
Vaccine

Additional Information

The HIV genome consists of two identical single-stranded RNA molecules that are enclosed in the core of the virus particle. The viral particle is approximately 100 nm in size.

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Other relevant website addresses and/or attached documents

- ? [UNAIDS](#) (*English*)
- ? [Global and regional molecular epidemiology of HIV-1 1990-2015 - a systematic review, global survey, and trend analysis.pdf](#) (*English*)
- ? [HIV-1 Assembly, Budding, and Maturation.pdf](#) (*English*)
- ? [HIV-1 Pathogenesis - The Virus.pdf](#) (*English*)
- ? [HIV infection.pdf](#) (*English*)
- ? [NCBI Taxonomy Browser - Human immunodeficiency virus 1](#) (*English*)
- ? [Human Immunodeficiency Virus \(HIV\).pdf](#) (*English*)

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Further Information

Questions about the Cartagena Protocol on Biosafety or the operation of the Biosafety Clearing-House may be directed to the Secretariat of the Convention on Biological Diversity.

Secretariat of the Convention

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