**HPV - human papilloma virus**

HPV has a circular, double stranded DNA, protected by capsid proteins. More than 100 HPV-types are known. HPV16 and 18 cause 70% of all cervix cancers.

![Diagram of HPV infection and replication](image1)

- Infection by HPV
  - HPV infects epithelial cells in the cervical mucosa. HPV DNA integrates into the cellular genome when causing cancer.
  - Infection by HPV results in viral replication, which typically heals within two years.
  - HPV DNA is integrated into tumor cell DNA, with only 0.8% developing cancer.

- Discovery of HPV DNA in cancer cells
  - Harald zur Hausen found HPV DNA in patient DNA (+).

**HIV - human immunodeficiency virus**

HIV is a retrovirus of the lentivirus group. Viral RNA is converted to DNA, which integrates into the cellular genome.

![Diagram of HIV discovery and replication](image2)

- Discovery of an unknown virus
  - Patient with swollen lymph nodes
  - T cells from lymph nodes are cultured
  - Virus replication occurs in infected cells
  - Virus detected within ~2 weeks
  - Electron microscopy identifies retroviral particles budding from infected T cells.

- Discovery of HIV in patients
  - Virus production detected in T cells by reverse transcriptase activity.

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