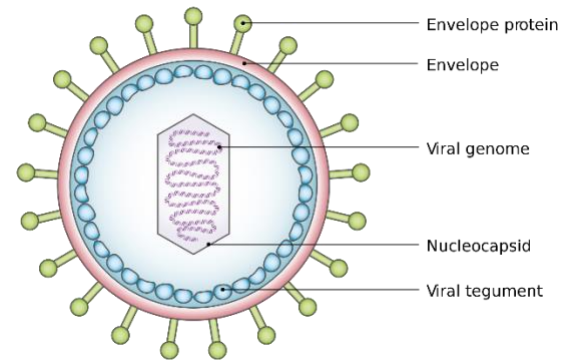


# Virology

## Lecture 1: Virus structure and classification

- Viruses
  - Nucleic acid genome packaged in protein coat
    - Protects and allows transmission
    - Functions as a delivery device
  - Unable to generate energy or synthesise proteins
    - Metabolically inert
    - Obligate intracellular parasites
  - Viruses replicate
    - Cannot grow or divide
    - Must make mRNA
  - Enter host cells via receptors
    - Infect all forms of life
  - Can be viewed by electron microscopy
- Genome
  - Virus genetic code
  - RNA or DNA
  - ss or ds
  - Segmented, linear or circular
  - Contains ORFs
  - Acts directly as mRNA or template
  - Viruses use cellular machinery for protein production
- Nucleocapsid
  - Composed of virus encoded proteins
  - Contains receptor binding motifs (non-enveloped)
  - Protects viral genome
  - Assists transmission and infection
  - Highly immunogenic
  - Tightly arrange as icosahedral or helical
  - Icosahedral nucleocapsid
    - Assemble spontaneously
    - Tightly interlocked structure
    - RNA/DNA is packaged in NC
    - Non-enveloped viruses
      - Released by cell lysis
      - Cytopathic



- Poliovirus, human papillomavirus
- Enveloped viruses
  - Released by budding
  - Herpes, Hep B