

Course: Virology

Classification of virus

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VIRUS - DEFINITIONS

- **Virus particle or virion**
 - Infectious agent composed of nucleic acid (RNA or DNA), a protein shell (capsid) and, in some cases, a lipid envelope
- **Capsid**
 - Protein coat that surrounds the viral nucleic acid
 - Composed of repeating subunits called capsomeres
 - Have either icosahedral or helical symmetry
- **Nucleocapsid**
 - Complete protein-nucleic acid complex

Virus definitions cntd....

Satellite or defective viruses

- Viruses which require a second (helper) virus for replication
 - Example: hepatitis delta virus requires hepatitis B

Viroids

- Small, autonomously replicating molecules
- Single stranded circular RNA, 240-375 residues in length
- Plant pathogens

Virus definitions cntd....

Prions

- Not viruses
- Infectious protein molecules responsible for transmissible and familial spongiform encephalopathies
 - e.g., Creutzfeldt-Jakob disease, bovine spongiform encephalopathy (vCJD in humans)
- Pathogenic prion protein PrP^{Sc} formed from normal human protein, PrP^{C} , through post-translational processing

Virus Classification

- Older - based on
 - Host, target organ or vector
- Modern - based on
 - Type of viral nucleic acid
 - RNA or DNA
 - Single stranded (SS) or double stranded (DS)
 - Replication strategy

Virus classification contd....

- **Modern - based on**
 - **Capsid symmetry**
 - Icosahedral or helical
 - **Presence or absence of lipid envelope**
- **Governed by International Committee on Taxonomy of Viruses**

Virus classification contd....

The Baltimore classification system

Based on genetic contents and replication strategies of viruses. According to the Baltimore classification, viruses are divided into SEVEN CLASSES.

Virus classification contd....

- 1. dsDNA viruses**
- 2. ssDNA viruses**
- 3. dsRNA viruses**
- 4. (+) sense ssRNA viruses (codes directly for protein)**
- 5. (-) sense ssRNA viruses**
- 6. RNA reverse transcribing viruses**
- 7. DNA reverse transcribing viruses**

(where "ds" represents "double strand" and "ss" denotes "singlestrand").

Thank you