

General Virology:

- viruses are not classified in the 5 kingdom classification
- no well-defined cellular organisation
- obligate intracellular parasite
- replicate in the host cell

Size: 20 nm - 300 nm (ultramicroscopic except largest \Rightarrow Poxviruses \Rightarrow 300 nm)

- largest pathogenic viruses: Poxviruses (200 - 300 nm)
- smallest " " : Parvoviruses (18 - 20 nm)

Estimation of size of viruses:

- done by one of the following mechanisms:
 - passing them through gradocol filters (pore size is known)
 - Ultracentrifuge \Rightarrow depending on rate of sedimentation
 \Rightarrow using Stoke's Law
 - Electron microscope \Rightarrow comparing their size with known objects

Shape:

Reoviruses (rotav.)

Ebola, Marburg

Rhabdovirus (rabies)

Poxviruses

Corona virus

Adenovirus

Astroviruses

wheel shaped double-shelled capsid

filament shaped \Rightarrow Filoviruses

bullet "

brick shaped

Solar corona

Spaceship/vehicle

star shaped

Genome: either DNA or RNA (never both)

→ DNA ⇒ ds

⇒ ss - **Poxviruses**

⇒ partially ds - **hep. B**

→ RNA ⇒ ss

+ve sense -ve sense

⇒ ds - **Reoviruses**

DNA viruses: $N^2 A P^4 Y$

H - Hepadna (ds)

H - Herpes "

A - Adeno "

P - Pox "

P - Polyoma "

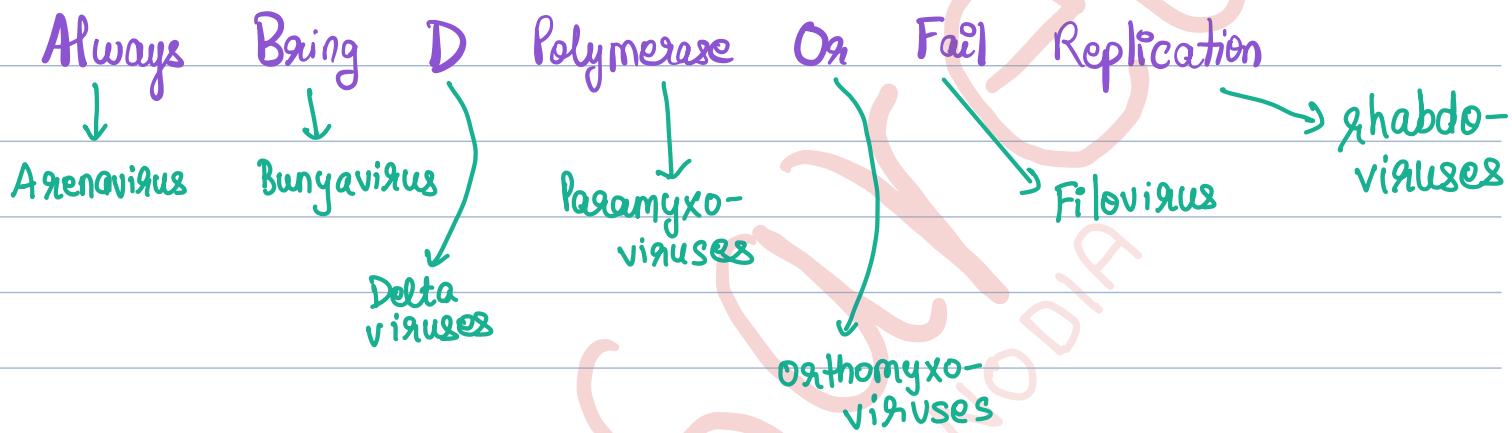
P - Papilloma "

P - Parvo (ss)

RNA viruses:

-ve sense/ Ambisense: (cannot be directly translated into proteins by ribosomes)

∴ inside the host, ambisense viruses have to synthesize +ve sense RNA for protein formation [RdRp - RNA dependent RNA polymerase \Rightarrow required for synthesis of +ve sense RNA which is carried by the virus itself]



+ve Sense: (can directly synthesize proteins from +ve sense RNA)

Astrovirus

Calicivirus

Coronavirus

Flavivirus

Hepavirus

Matrix virus

Reovirus

Retrovirus

Togavirus

Segmented Genome RNA viruses:

- Reoviruses → 10-12 segments
- Orthomyxoviruses → 7-8 "
- Bunyaviruses → 3 "
- Arenaviruses → 2 "

→ presence of segments ⇒ these viruses can show genetic reassortment.

Protein Coat [Capsid]:

→ covers the nucleic acid

[nucleic acid + protein coat = nucleocapsid]

→ made of capsomeres (protein subunits)

→ arrangement of capsomeres determines \Rightarrow Capsid Symmetry

Capsid Symmetry:

helical

icosahedral

Icosahedral: All DNA viruses

Except: Poxviruses \Rightarrow complex symmetry

Helical: Some RNA viruses

Always — Arenaviruses
Biting C — Bunyaviruses
Corona

Polymerase — Paramyxo
Or — Orthomyxo
Fail — Filo

Replication — Rhabdo

Rest all RNA viruses

↓
icosahedral
symmetry

Lipid Envelope: may or may not be present

→ viruses without envelope: Naked viruses

→ viruses with envelope: Enveloped viruses

→ Lipid envelope makes the virus soluble in lipid solvents

∴ enveloped viruses are easier to kill

Enveloped DNA Viruses:

- Pox
- Herpes
- Hepadna

Naked DNA viruses:

- P - Poxv
- A - Adeno
- P - Polyoma
- P - Papilloma