



Lecture title: Family of RNA viruses

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3- Paramyxoviridae

Paramyxo= Along - side mucous

General characters:

- a. Large pleomorphic enveloped viruses (150 nm or more).
- b. Negative sense single –stranded RNA, (non segmented).
- c. Helical symmetrical nucleocapsid.
- d. Replicate in the cytoplasm.
- e. Genetically stable & not exhibit recombination but some antigenic variation may occurs through mutation.

Genera of Paramyxoviridae:

1. Respiro virus: Bovine parainfluenza virus 3.
2. Morbillivirus : - Rinderpest virus.
- Peste des petits ruminants virus.
- Canine distemper virus.
3. Rubella virus : - Newcastle disease virus.
-Avian parainfluenza virus.
4. Pneumovirus : Bovine respiratory syncytial virus.
5. Meta pneumovirus: Turkey rhinotracheitis virus.

4- Coronaviridae

Corona = crown

General characters:

- a. Large (120-160 nm) pleomorphic, enveloped virus.
- b. Single – stranded, positive – sense RNA.
- c. Replicate in cytoplasm.
- d. Club- shaped glycoprotein peplomers projecting from the envelope as crown – like appearance.
- e. Sensitive to heat, lipid solvents, some are stable at PH= 3.

Genera of coronaviridae:

1. Corona virus: spherical, helical nucleocapsid causing respiratory disease in poultry (infectious bronchitis disease).
2. 2. Toro virus: Tubular nucleocapsid, kidney- shaped or rod shaped 120-140 nm in diameter.



5- Reoviridae

Respiratory enteric orphan

General characters:

- Non-enveloped with double or triple layered capsid & icosahedral structure 60-80 nm in diameter.
- Segmented (10-12 segments) double- stranded RNA.
- Replicate in cytoplasm with intracytoplasmic inclusion bodies.
- Genetic reassortment readily takes place.
- Resistant to heat, organic solvents.

Genera of Reoviridae :

- Orthoreovirus: cause arthritis & tenosynovitis in poultry.
- Rotavirus : cause enteritis in neonatal farm animals.
- Orbivirus: Arthropods- borne infections (Arbo), cause:
African horse sickness in horses, Bluetongue disease in sheep , and in other domestic & wild ruminants.

6-Retroviridae

Reverse transcriptase

General characters:

- Labile enveloped RNA viruses 80-100 nm in diameter.
- Diploid containing two linear positive- sense strands of RNA.
- Most members of this family possessing a reverse transcriptase which transcribes viral RNA to double-stranded DNA.
- Mutation and recombination occur with high frequency.

Genera of Retroviridae:

- Alpha retrovirus causing- avian leucosis, avian sarcoma, avian myeloblastosis, rous sarcoma
- Beta retrovirus : mouse mammary tumor virus.
- Gamma retrovirus: feline leukemia feline sarcoma.
- Delta retrovirus: bovine leukemia.
- Epsilon retrovirus: fish tumor virus.
- Lentivirus :
 - Human immunodeficiency virus 1,2 HIV (AIDS)
 - Simian immunodeficiency virus.
 - Maedi/visna virus.
 - Caprine arthritis, encephalitis virus.
 - Equine infectious anemia virus.
 - Feline immunodeficiency virus.
 - Bovine immunodeficiency virus.
- Spuma virus: viruses causing vacuolation cultured cells not associated with the clinical disease.



7. Rhabdoviridae

Rod

General characters:

- Have characteristic rod shapes and bullet-shaped in vertebrates .
- enveloped RNA viruses with helical symmetry.
- virions size (100-430 nm X 45-100 nm).
- Stable in the pH range of 5- 10.
- Rapidly inactivated by heating at 56 C°.
- Sensitive to lipid solvents and UV light.

Genera of Rhabdoviridae:

- Lyssavirus: Rabies virus .
- Ephemero virus: Bovine ephemeral fever virus.
- Vesiculovirus: vesicular stomatitis virus.

8. Birnaviridae

Bi-RNA

General characters:

- Double stranded RNA icosahedral symmetry.
- Virions are 60 nm in diameter.
3. Virions stable over a wide pH range and 60 C° for 1 hour, resistant to ether and chloroform.

Genera of Birnaviridae:

- Avibirna virus: - infectious bursal disease (Gumboro).
- Aquabirna virus: - infectious pancreatic necrosis in salmonids (fish).
- Entomobirna virus: - infect insects.

9. Bornaviridae

General characters:

- Enveloped virus, spherical 90 nm in diameter.
- Single stranded RNA, negative-sense.
- Replicates in nuclei of neural cells.
- Sensitive to heat, lipid solvents and low pH values.

Only one genus: Borna virus causing Borna disease an infection of the CNS, fatal in many domestic species, particularly horses.

Antibodies reacting with BDV have been found in the sera of human patient with psychiatric disorders and a possible link between infection with the virus and human neurological disorders is being investigated.



10- Bunyaviridae

Bunyamwera (place in Uganda)

General characters:

- a. Medium sized 80-120 nm, enveloped, single stranded RNA viruses, and spherical shape.
- b. Sensitive to heat, acid pH levels, lipid solvents.
- c. More than 300 viruses in the family most of them Arbo.

Genera of Bunyaviridae:

Family composed of five genera.

1. Bunyavirus: causes congenital defects in cattle and sheep.
2. Phlebovirus: rift valley fever.
3. Nairovirus: Nairobi sheep disease.
4. Hantavirus: haemorrhagic fever in human.
5. Tospovirus: viruses of plants