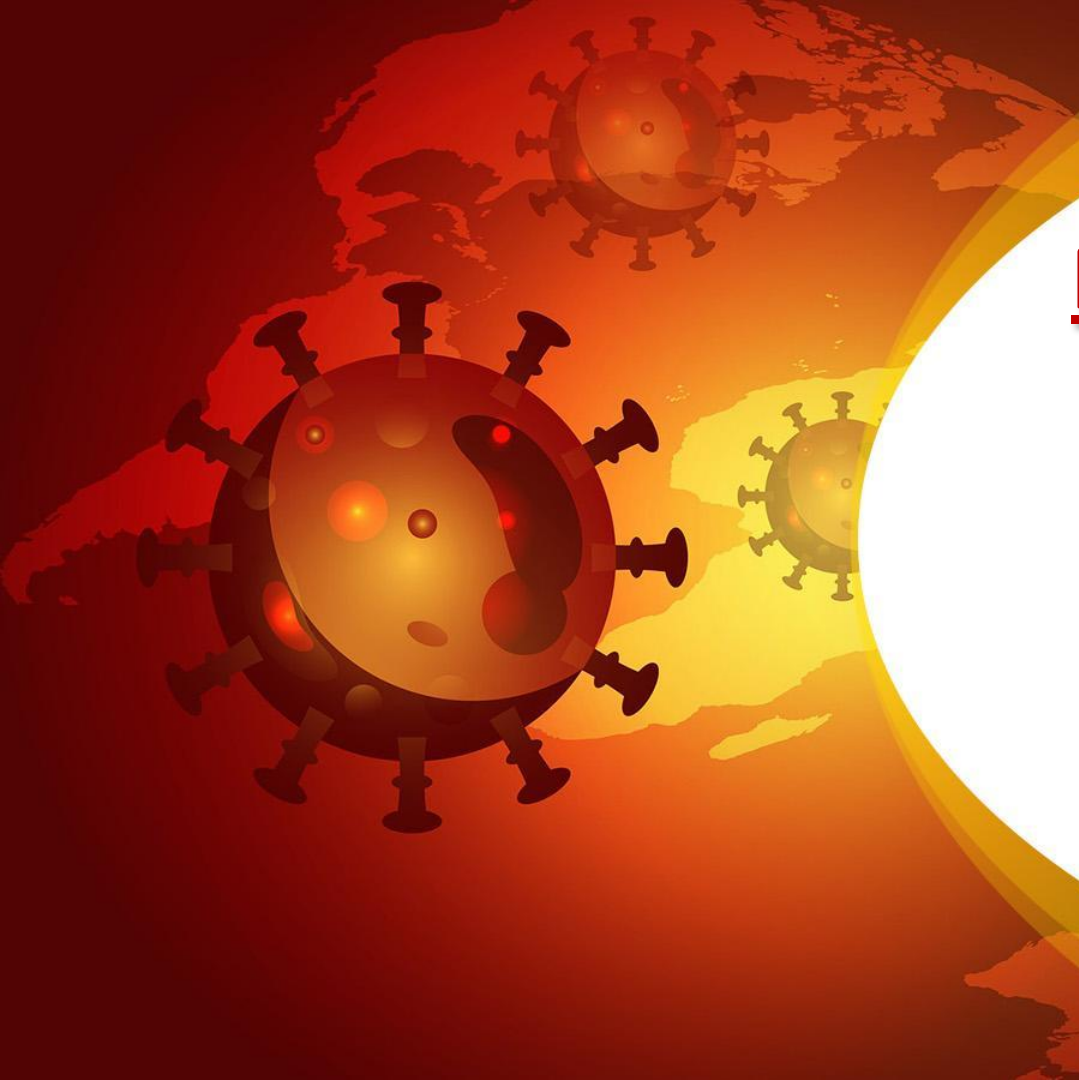

NIPAH AND HENDRA VIRUS

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LA2-191(2)

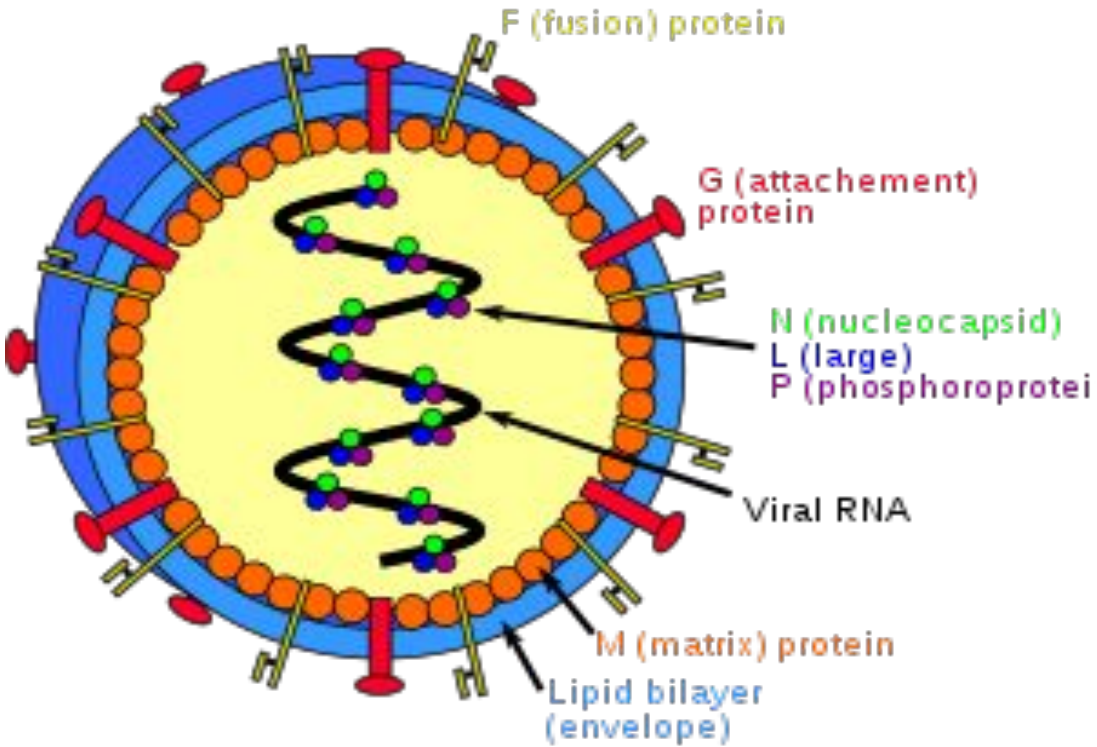
COURSE:3rd Year

DEPARTMENT : MEDICAL MICROBIOLOGY

NIPAH VIRUS INFECTION :

- The Nipah virus (NiV) is a type of RNA virus in the genus *Henipavirus*. The virus normally circulates among some fruit bats.
- It can both spread between people and from other animals to people. Spread typically requires direct contact with an infected source.
- It is also called as Barking Pig Syndrome , Poricine Respiratory and Encephalitis Syndrome , Poricine Respiratory and Neurologic Syndrome

NIPAH VIRUS STRUCTURE



Single –stranded negative sense RNA

18,246 NUCLEOTIDES in Length

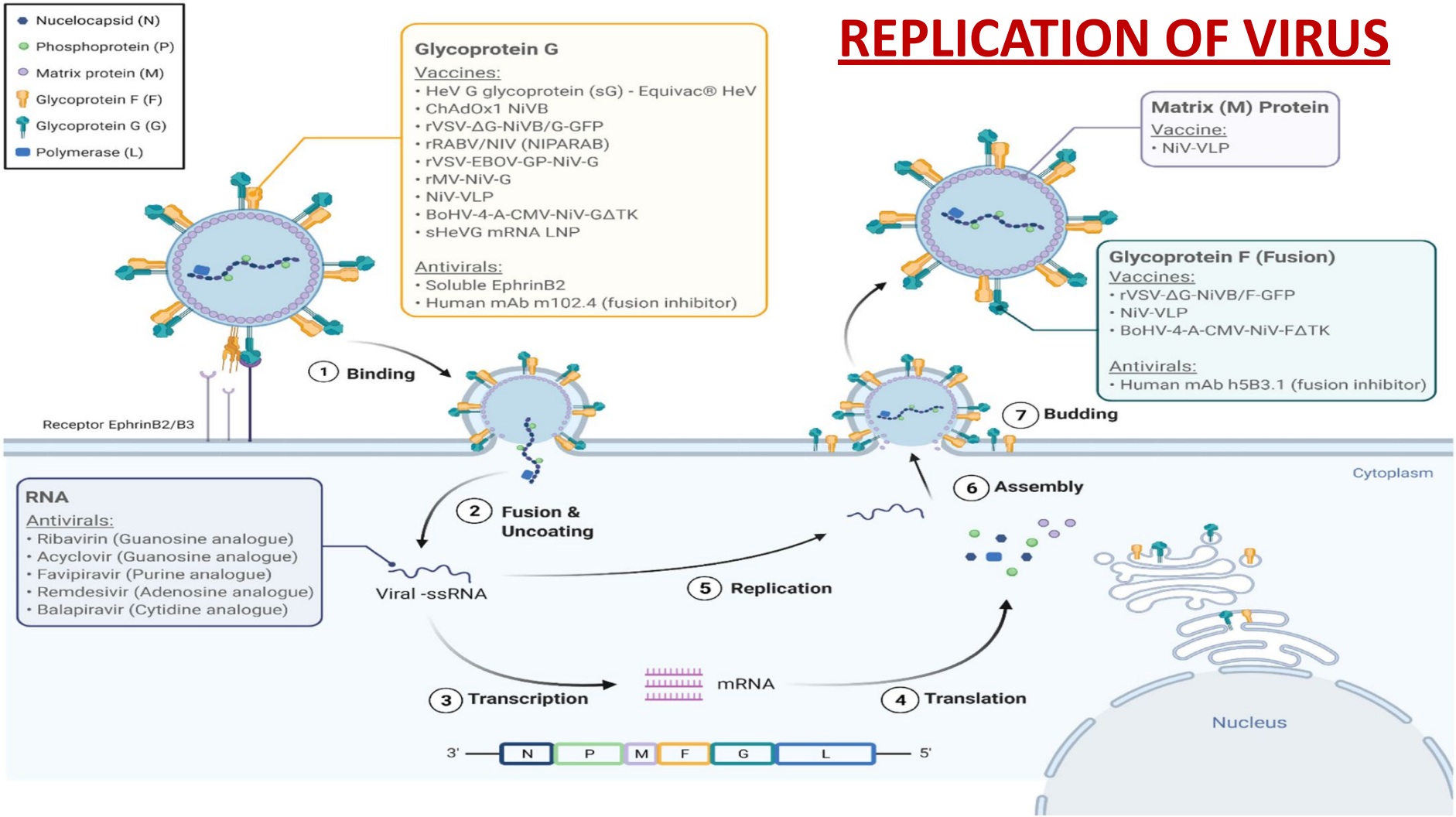
HISTORY :

- 1998-1999 Peninsular Malaysia,
- Human febrile encephalitis ,high mortality
- New virus discovered
- 1999- Singapore
- Outbreak in abattoir workers
- Pigs imported from Malaysia
- Since 2001 - Bangladesh ,India

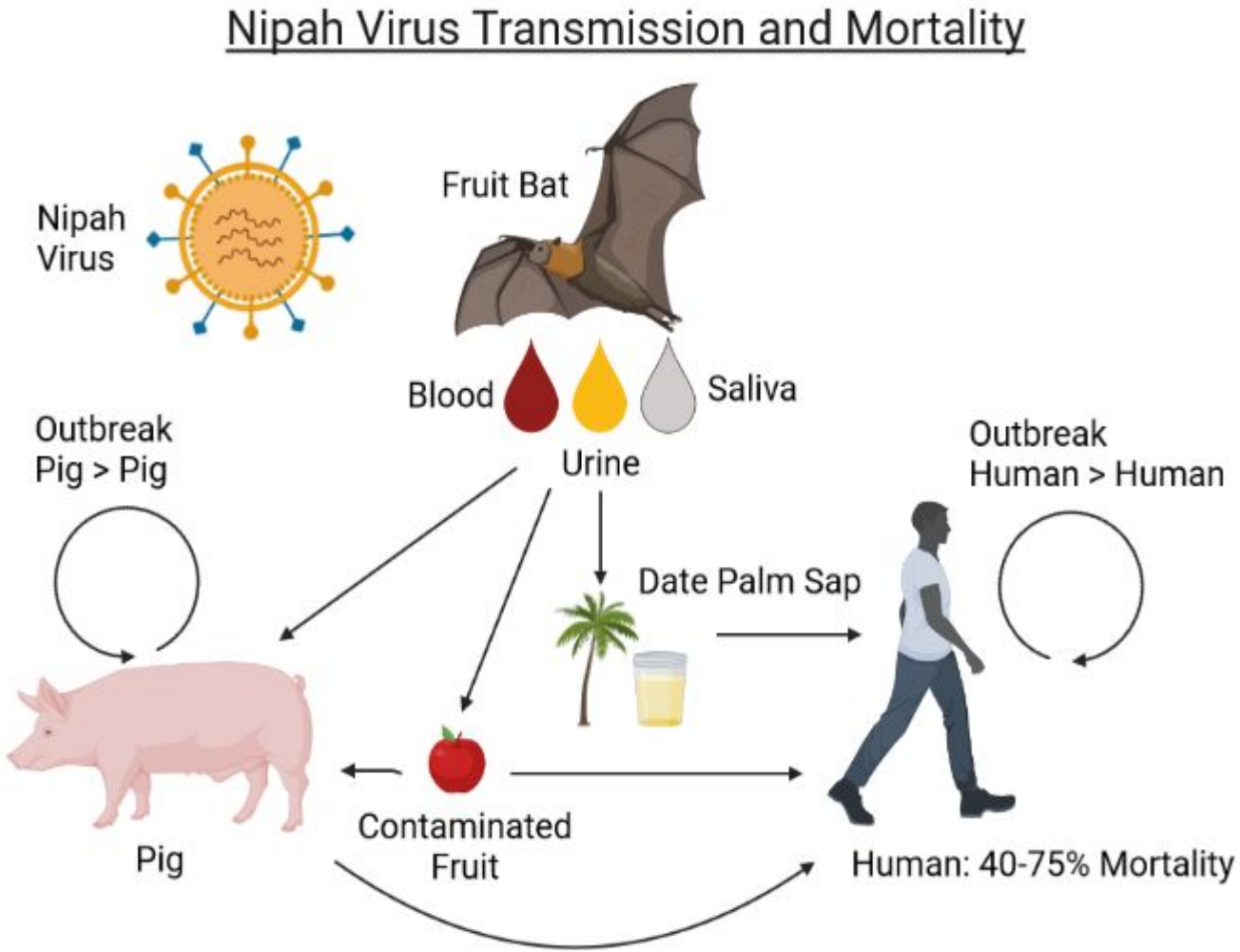
EPIDEMIOLOGY

- 1998-1999 Malaysia 265 persons hospitalized ,105 deaths
- Primarily adults males with swine contact .
- India has reported 2 outbreaks of NIPAH virus encephalitis in the ester state of west bengal bordering Bangladesh in 2001 and 2007.
- An outbreak in Siliguri, west Bengal ,india in 2001 was linked to nosocomial transmission in hospitals and ended after effective barrier nursing precautions were put in place.

REPLICATION OF VIRUS



Transmission

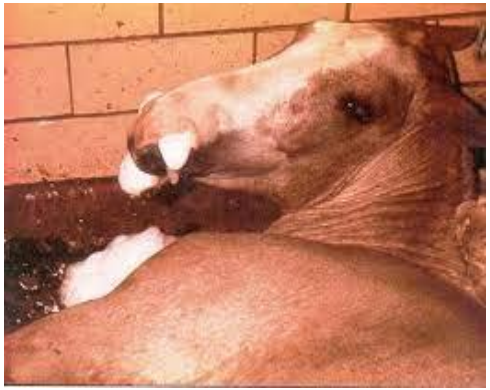


DISEASE IN HUMAN :

- **Incubation period** : Between 4 & 18 days .In many cases infection is mild or unapparent (sub-clinical).
- **In symptomatic cases**: Onset is usually with “influenza-like” symptoms, with higher fever and muscular pain.
- Disease may progress to : Inflammation of brain (encephalitis) with drowsiness ,disorientation ,convulsions and coma.
- It also causes a diffuse vasculitis, the virus is commonly identified in lungs and kidneys
- **Complications**: Septicemia , GI bleeding , Renal impairment
- **Asymptomatic** : Relapse or late onset deficits and Residual neurological deficits

DISEASE IN ANIMALS :

- DOGS : Distemper like signs
- Fever , respiratory distress
- ocular & nasal discharge
- CAT: Fever
- depression
- Severe respiratory signs
- HORESE : Encephalitis



DIAGNOSIS:

- Differentials for swine : Classical swine fever ,PRRS, pseudorabies, swine enzootic pneumonia ,porcine pleuropneumonia
- **Diagnostic test**: ELISA ,Immunohistochemistry ,PCR, Virus isolation
- After recovery, IgG and IgM antibody detection can confirm a prior Nipah virus infection.

TREATMENT AND PREVENTION:

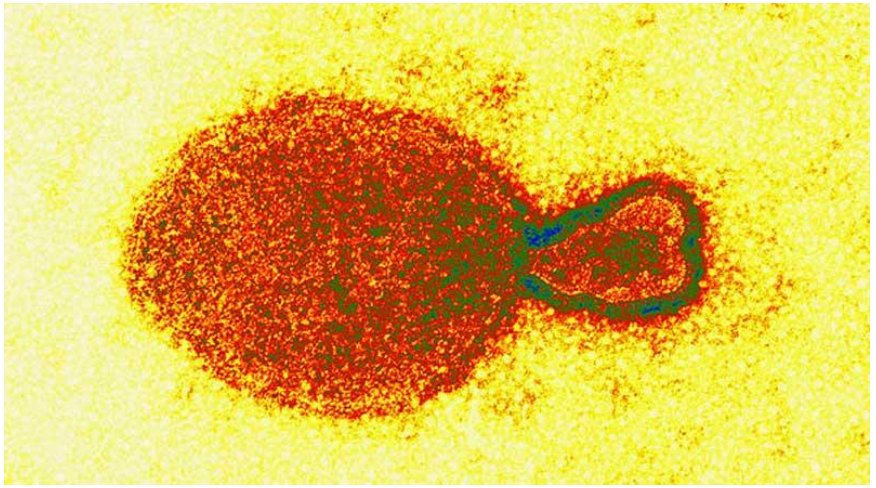
- Rabavirin –reduces mortality
- Soluble version of the G Glycoprotein and Ephrin B2 shown to inhibit Niv envelope –mediated infection.
- Recombinant vaccine : virus recombinants expressing the Nipah virus G or F glycoprotein

PREVENTION:

- Keep fruit bats away from pigs
- Do not drink unpasteurized fruit juices
- Wash peel fruit thoroughly before eating.

HENDRA VIRUS :

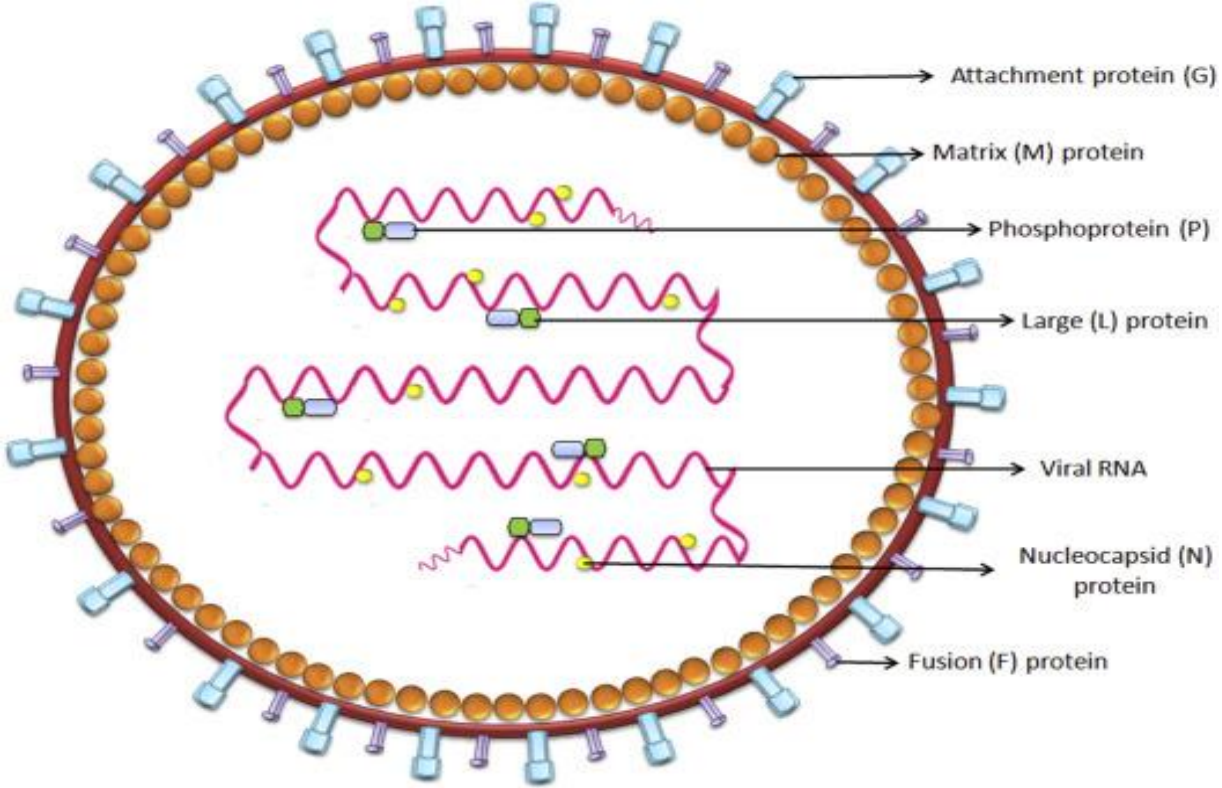
- Family **Paramyxoviridae**
- Genus Henipavirus
- Closely related to Nipah virus
- Its is large ,pleomorphic enveloped
- Single-stranded RNA virus
- Family includes
- Mumps and measles
- Rinderpest virus
- Human parainfluenza virus
- Canine distemper virus



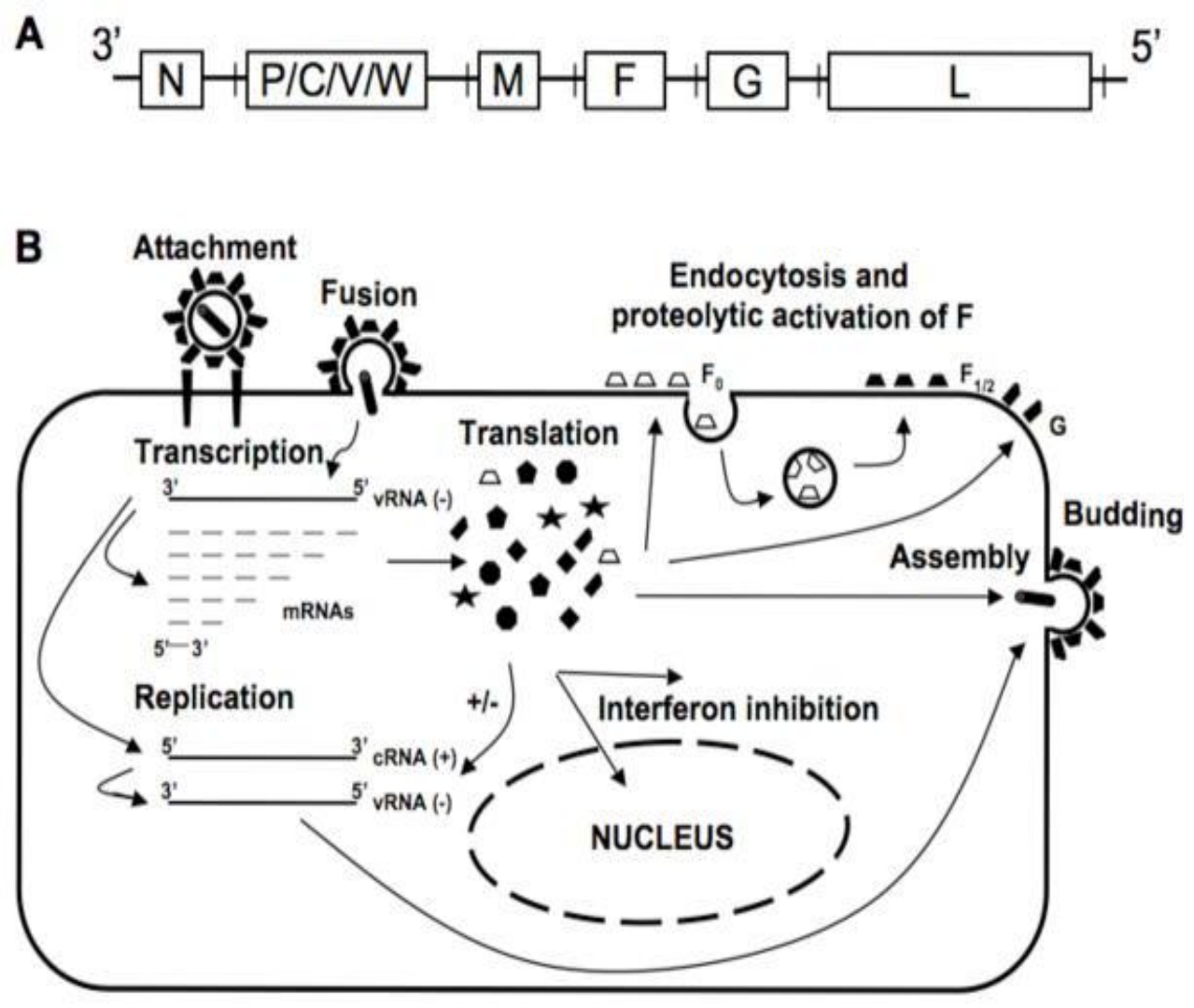
EPIDEMILOGY :

- Hendra virus was first described in September 1994 in Hendra, a suburb of Brisbane, Australia following an investigation of an outbreak of severe acute respiratory disease and high fever in 14 of the 20 horses on a single property.
- Two people with a history of close contact with the affected horses were infected; one died within a week of infection, and the other recovered .
- A similar event occurred in Mackay, Queensland, Australia involving two horses and a human the month prior (August 1994)
- Overall, the current approximate case fatality rate in horses and humans is 80% and 60% respectively

HENDRA VIRUS STRUCTURE:



Single-stranded
Negative-sense RNA



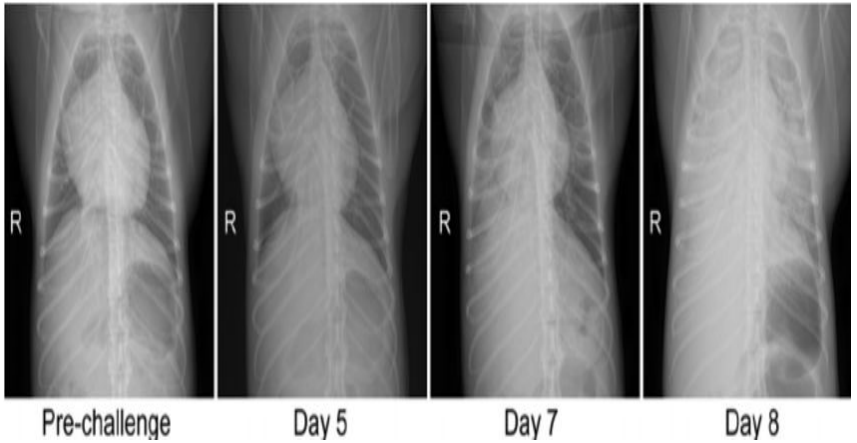
REPLICATION CYCLE

PATHOGENESIS

- Hendra virus has a specific tropism for vascular tissues, regardless of route of challenge.
- In early infection, the vascular lesions may include edema and haemorrhage of vessel walls, fibrinoid degeneration with pyknotic nuclei in endothelial and tunica media cells, and numerous giant cells (syncytia) in the endothelium.
- The virus becomes more widely distributed in various tissues throughout the body as infection progresses, presumably as a result of a leukocyte-associated viremia.
- Respiratory signs can include:
- pulmonary edema and congestion
- respiratory distress (increased respiratory rate)
- terminal nasal discharge, which may be clear initially and progress to stable white or blood-stained froth
- Neurologic signs can include:
- “wobbly gait” progressing to ataxia
- altered consciousness (apparent loss of vision in one or both eyes, aimless walking in a dazed state)

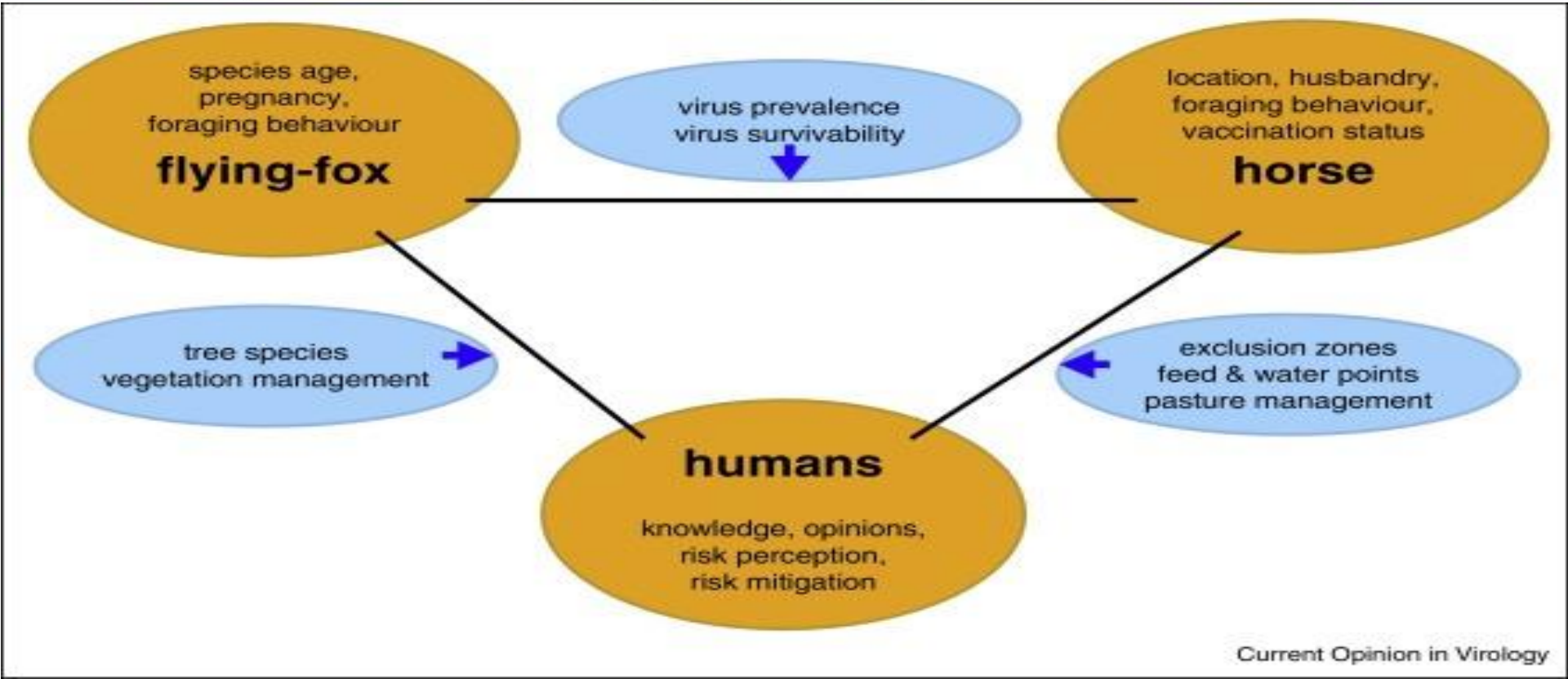
HUMAN DISEASE:

- Incubation period 4-18 days ,may be up to a year
- Flu-like symptoms
  - Fever
  - Myalgia
  - Headaches
  - Vertigo



- Pneumonitis : Rapid progression to respiratory failure
- Meningoencephalitis

TRANSMISSION:



DIAGNOSIS:

- ELISA
- Immunoperoxidase: Formuline fixed tissues
- Virus isolation
- Virus neutralization : Detect antibodies
- PCR

- **TREATMENT:**
- There is **no specific antiviral treatment**
- Intensive supportive care
- Ribavirin
- Prognosis uncertain due to lack of cases

- PREVENTION:
- Prevention focuses on minimizing contact with fruit bat body fluids.
- Control is based on euthanasia and deep burial of infected cases; monitoring, isolating, and restricting movement of in-contact animals; and disinfection of potentially contaminated surfaces.
- A **vaccine**, containing a noninfectious protein component (G protein) of the virus, has been developed.


THANK YOU