



# EB00000LA VIRUS

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# What is Ebola Virus

- Part of the neg- ssRNA family known as the Filovirus.
- Two viruses in the family
  - Ebola
  - Marburg
- Level 4 pathogen
- Causes haemorrhagic fever
  - (most current) Glycoprotein affects epithelial cells

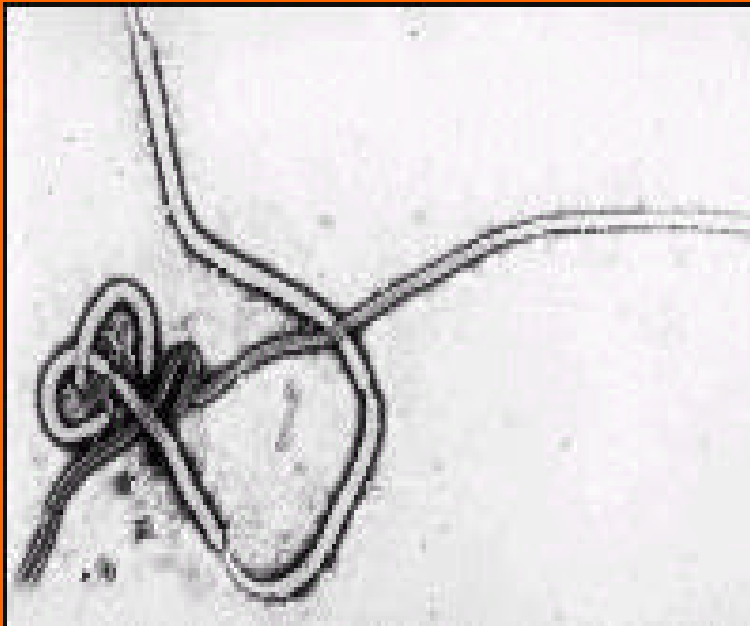
# Transmission of Ebola Virus

- Natural reservoir(s) are unknown
- Have the potential for airborne transmission
  - Reston strain
- Are zoonotic agents
  - Monkeys (maintained as a latent infection)

# Ebola Virus Morphology

- Filamentous morphology that are
  - Branched
  - Circular
  - U-shaped
- Have lipid envelope with helical protein coat

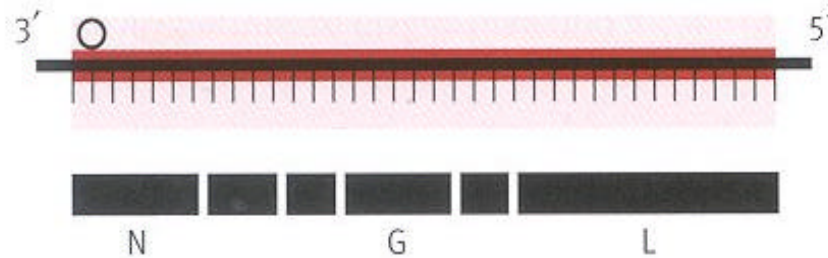
# Morphology of Ebola Virus



# Ebola Virus Genome

- Neg ssRNA, 19kb in size
- 7 open reading frames which code for 7 or 8 known proteins
- Stop, start signals at boundaries of each gene.
- Similar to the paramyxoviruses
  - Rabies and Measles

# Ebola Virus Genome



**g. 28.2** Filovirus genome and encoded proteins. Labelled proteins are (nucleoprotein), G (glycoprotein spike), and L (polymerase). Other proteins are not labelled. O, RNA transcriptase.

# Ebola Virus Detection

- May be isolated from blood and tissue
- Identified by
  - Electron microscope
  - Immunofluorescence
- Viral antigens (Serology)
  - ELISA
  - PCR



# Incubation and Symptoms

- 3-16 day incubation death shortly after
- 70% - 90 % fatality rate (Depend on strain)
- Early Symptoms
  - High Fever, frontal headaches, back pains, loss of appetite.
- Late Symptoms usually 5 to 7 days
  - Severe bleeding of: lungs, nose, gums, gastrointestinal tract, and conjunctiva.

# Ebola Virus Strains

(all 4 are genetically distinct)

- Ebola Sudan
- Ebola Zaire
- Ebola Reston
- Ebola Tai (Ivory Coast)

# Marburg Virus Strains

- Marburg Europe (Earliest Afr grn monkeys)
- Marburg Zimbabwe
- Marburg Kenya

# Ebola and Marburg Virus History

DOCUMENTED FILOVIRUS INFECTIONS				
VIRUS	YEAR	LOCATION	CASES	% MORT
Marburg	1967	Europe	31	23
Marburg	1975	Zimbabwe	3	33
Ebola (Zaire)	1976	Northern Zaire	318	88
Ebola (Sudan)	1976	Southern Sudan	284	53
Ebola (Sudan)	1976	England	1	0
Ebola (Zaire)	1977	Western Zaire	1	100
Ebola (Sudan)	1979	Southern Sudan	34	65
Marburg	1980	Kenya	2	50
Marburg	1987	Kenya	1	100
Ebola (Reston)	1989	Philippines/USA	4	0
Ebola (Reston)	1992	Philippines/Italy	0	0
Ebola (Cdl)	1994	Ivory Coast	1	0
Ebola (Zaire)	1995	Southern Zaire	318	77
Ebola (?)	1996	Eastern Liberia	1	0
Ebola (?)	1996	Northern Gabon	37	57

# Infected Geographical areas



# Current Outbreaks of Ebola Virus

- As of Oct 26, 2000 the Uganda Ministry of Health has reported.
  - 182 cases of Ebola hemorrhagic fever