

ASFARVIRIDAE: African Swine fever

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Asfarviridae

- Large viruses
- Highly complex genomes
- Ds DNA
- Distantly related to one another, as well as to other large DNA viruses in the family *poxviridae* and the order *Herpesvirales*
- African swine fever virus in the family *Asfarviridae* is the cause of African swine fever

- Severe haemorrhage
- Increased mortality
- Acute Hyperacute
- 5-15 days IP
- 40.5-42 degree c
- 1-2 days of onset, inappetance, diarrhea, incoordination and prostration
- Death

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- ◉ Dyspnea
 - ◉ Vomition
 - ◉ Nasal and conjunctival discharge
 - ◉ Reddening and cynosis of ear and snout
 - ◉ Haemorrhages from the nose and anus
 - ◉ Abortion
 - ◉ 100% mortality 1-3 days after fever

◉ Infected adult warthogs

DO NOT
DEVELOP
CLINICAL SIGNS



Subcutaneous haemorrhage

Splenomegaly



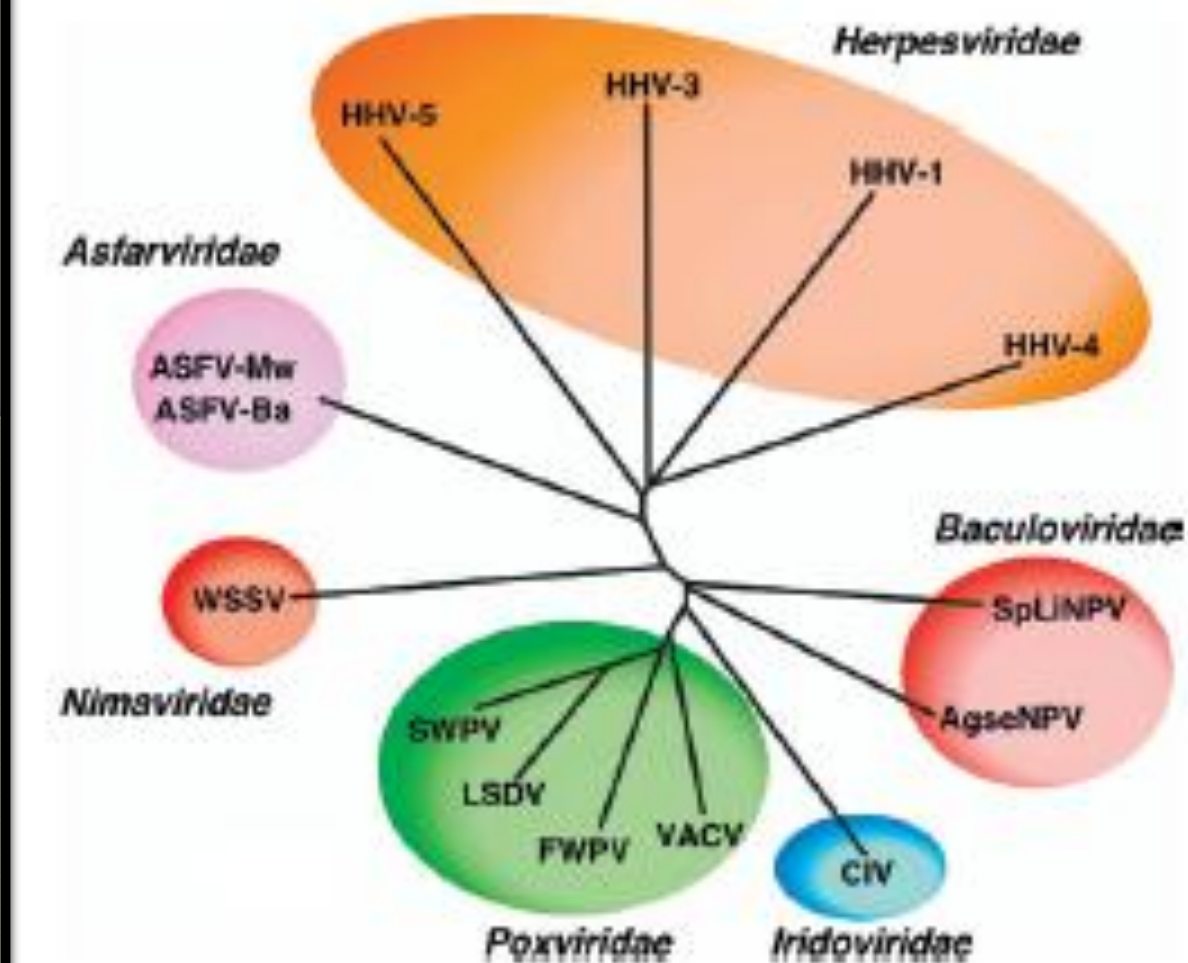
Subcutaneous haemorrhage



Splenomegaly

Chronic cases

- ◉ Cutaneous ulcers
- ◉ Pneumonia
- ◉ Pericarditis
- ◉ Pleuritis
- ◉ Arthritis



Phylogenetic tree comparing the dUTPase proteins encoded by ASFV with those of other DNA viruses. Sequences were aligned using ClustalW and the tree displayed using Treeview.

VIRION PROPERTIES

❖ ENVELOPED

❖ 200 NM IN DIAMETER

❖ NUCLEOCAPSID CORE

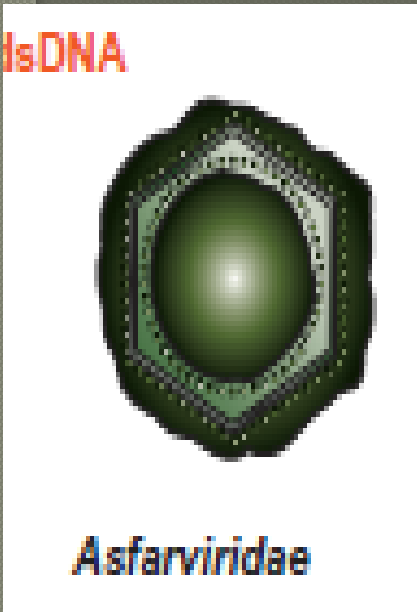
❖ **INTERNAL LIPID LAYERS AND A COMPLEX ICOSAHERAL CAPSID**

❖ CAPSID : **HEXAGONAL ARRANGEMENT OF STRUCTURAL UNITS EACH OF WHICH APPEARS AS A HEXAGONAL PRISM WITH A CENTRAL HOLE**

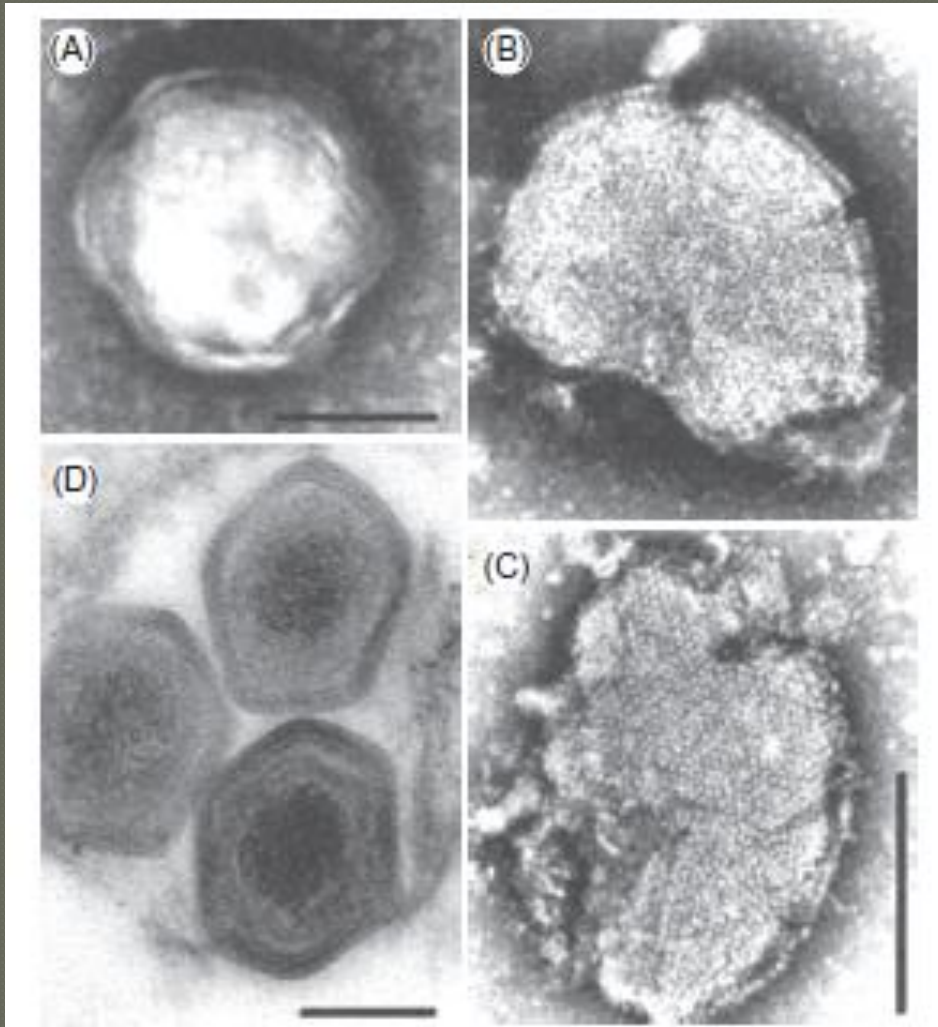
❖ GENOME: SINGLE MOLECULE OF LINEAR ds DNA, 170–190 KBP IN SIZE

❖ DNA: CCE-ITR-HAIRPIN LOOPS- 150 ORF-CLOSELY SPACED AND READ FROM BOTH DNA STRANDS

❖ ↑ 50 PROTEINS IN VIRIONS (ENZYMES AND FACTORS ;EARLY MESSENGER RNA (mRNA) TRANSCRIPTION AND PROCESSING)



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- ❖ THERMOLABILE
 - ❖ SENSITIVE TO LIPID SOLVENTS
 - ❖ VERY RESISTANT TO A WIDE RANGE OF PH (SEVERAL HOURS AT PH 4 OR PH 13)
 - ❖ HEAT, PUTREFACTION
 - ❖ SURVIVES IN REFRIGERATED/CHILLED MEAT, 6 MONTHS



- Hexagonal capsid
- Enveloped
- 1892-2172 structural units
- Multiple layers surrounding core

How ASFV affect

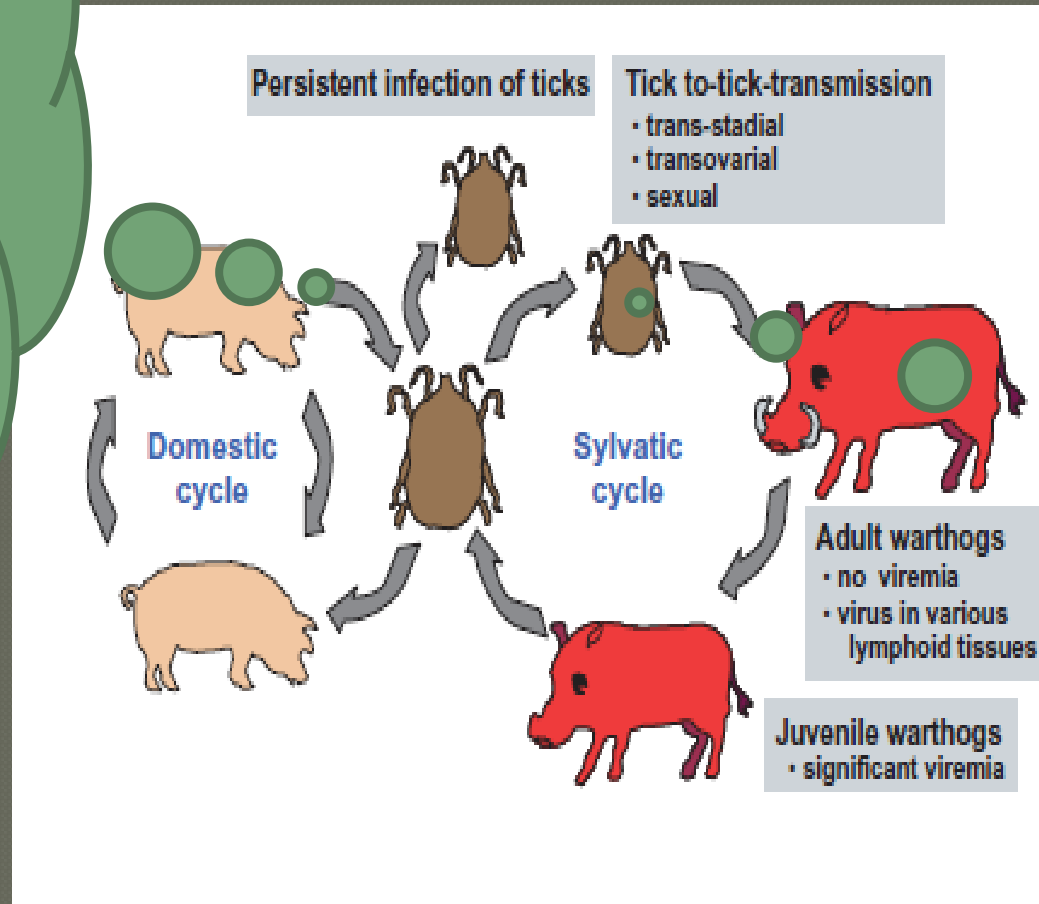
- ◉ Morbidity rate 100%
- ◉ Case fatality rate 70%
- ◉ ↓virulence
- ◉ Enzootic : case fatality 2-3%

What are the Four markers determining outcome of infection

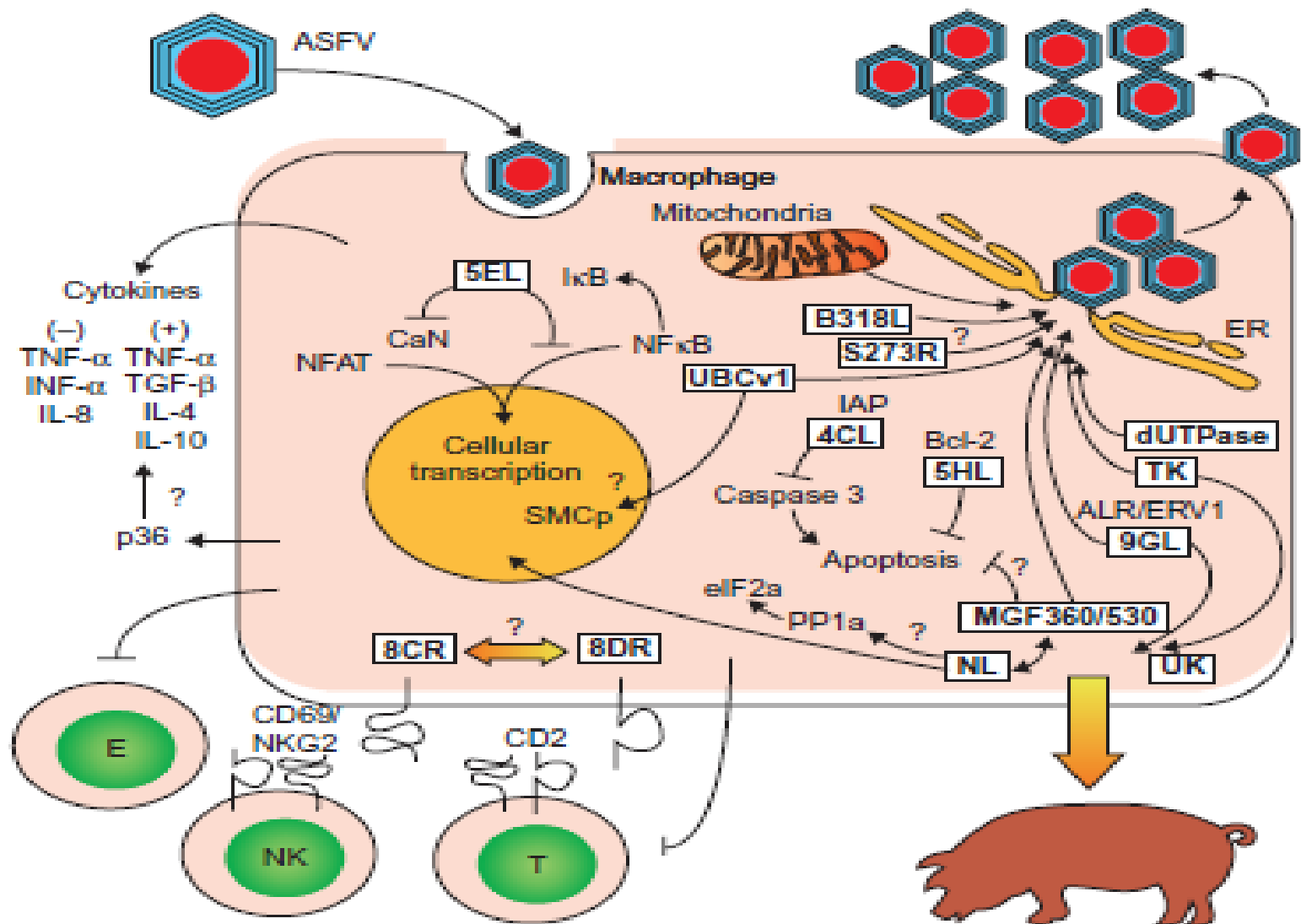
- ◉ Hemagglutination
 - ◉ Virulence
 - ◉ Plaque size
 - ◉ Antigenicity
-
- ◉ Highly virulent to some mortality
 - ◉ S/c or chronic

How ASFV transmit

Infected tick bite, meal on warthogs, infected animal source of infection, nasopharyngeal excretions, clinical signs faeces during acute stage



**SE Africa
Biological vector ,
Replicates
in gut-affect
repro.
system
Excreted in
saliva,
coaxal fluid,
Malpighian
excrement**



REPLICATION OF ASFV

Ticks involved for maintaining and transmission of ASFV

- Ornithodoros moubata
- Ornithodoros savignyi
- Ornithodoros erraticus
- Ornithodoros coriaceus
- Ornithodoros puerторicensis



**Maintain and transmit
the virus for
300 – 440 days**

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- ◉ 1978:
 - ◉ Malta
 - ◉ Sardinia
 - ◉ Brazil
 - ◉ Dominican Republic
 - ◉ Haiti

Diagnosis

- VI
- PCR
- IFT
- EIA
- ID

Elimination by killing entire population of species in the country

- ◉ 1978: Malta
- ◉ Death and Slaughter
- ◉ 80000 pigs
- ◉ Within 12 months of diagnosis

Immunity

- HI & CMI
- Antibodies: May protect against lethal challenge
- NA against p30, p54, p72 insufficient

Prevention and control

- ◉ Lack of effective vaccine
- ◉ Virus in fresh meats and cured products
- ◉ Persistent infection
- ◉ Diagnostic difficulty
- ◉ Soft tick transmit the agent

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- ◉ Feeding uncooked waste food scraps
 - ◉ Access to ticks
 - ◉ Contact with warthogs
 - ◉ Double fencing with wire mesh
perimeter fence extending beneath the
ground

ASFV free countries

Live
swine
and
products



Infected
countries



Non-Infected countries?
Status of non infected for India
abandoned as ASFV is reported
currently.

Reference

- Pictures/Diagrams/Photos are used purely for educational purposes from world wide web and books
- Textbooks related to virology by
 - Quinn et al.
 - Murphy, F.
 - Maclachlan, N.