

VIRUS

1ST SEM NEP

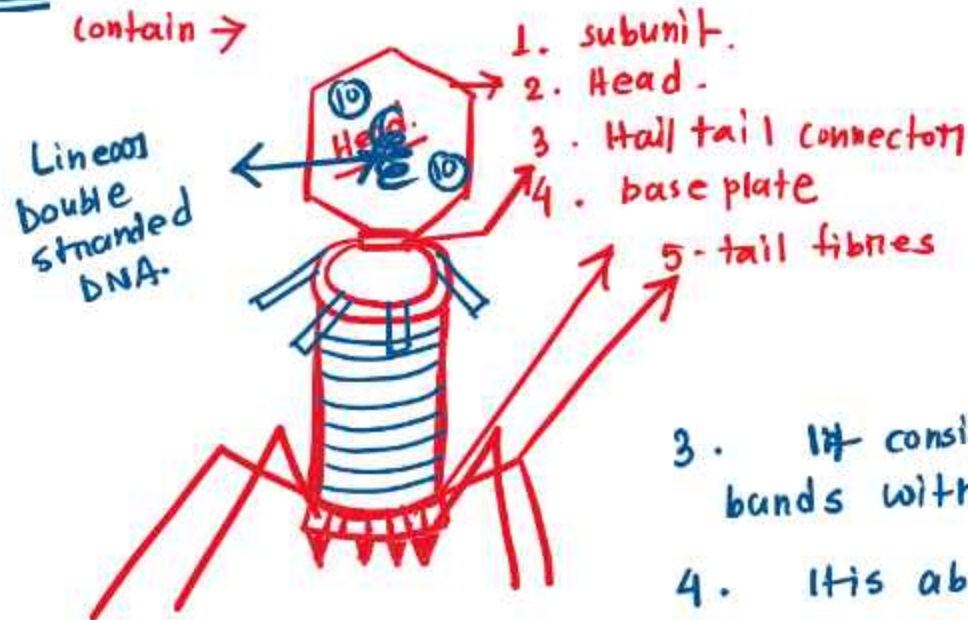
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Unit 2: Microbes (5)

Viruses- Discovery, General structure;
Economic importance;

T₄ virus → Tadpole shaped.
 = contain →



Head: 1. The head, capsid has the form of a icosahedron.

2. The str. has been described as an elongated, bipyramidal. hexagonal, prism.



3. It consist of 2 - 10 faced equilateral bands with a pyramidal vertex at either end.

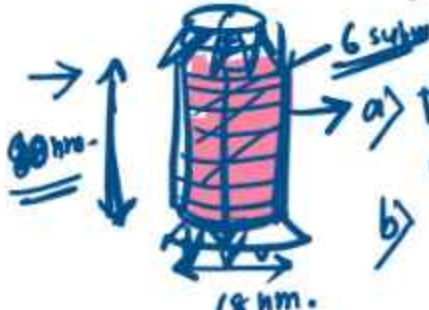
4. It is about 95 nm. long Δ → 65 nm. wider.

5. The head contain linear double stranded DNA molecule, several peptides, 3 internal proteins.

6. Head capsid is made up - 2000 similar subunits.

7. The DNA contain hydroxymethyl cytosine.

2. Head - tail connector → The head tail connector has a collar with attached whiskers.

3. The tail → 
a) Tail consist of a contractile sheath surrounding an inner cone.
b) It is about 80 nm. long and 18 nm. in diameter.

c) The tail sheath consist of 144 subunits arranged in 24 rings of 6 subunits each.

d) It is connected to the collar at the upper end and base plate at lower end.

e) The cone has an axial note of 20 Å.

4. The base plate : The base plate is hexagonal, and has 2 spike at each corner.

5. Tail fibres →



From each of the six corners of the baseplate is given off a long thin tail fibre. The fibre is composed of 2 different half.

a) proximal half → attached with virus.

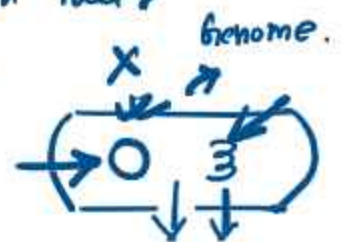
b) distal half → — — Bacteria

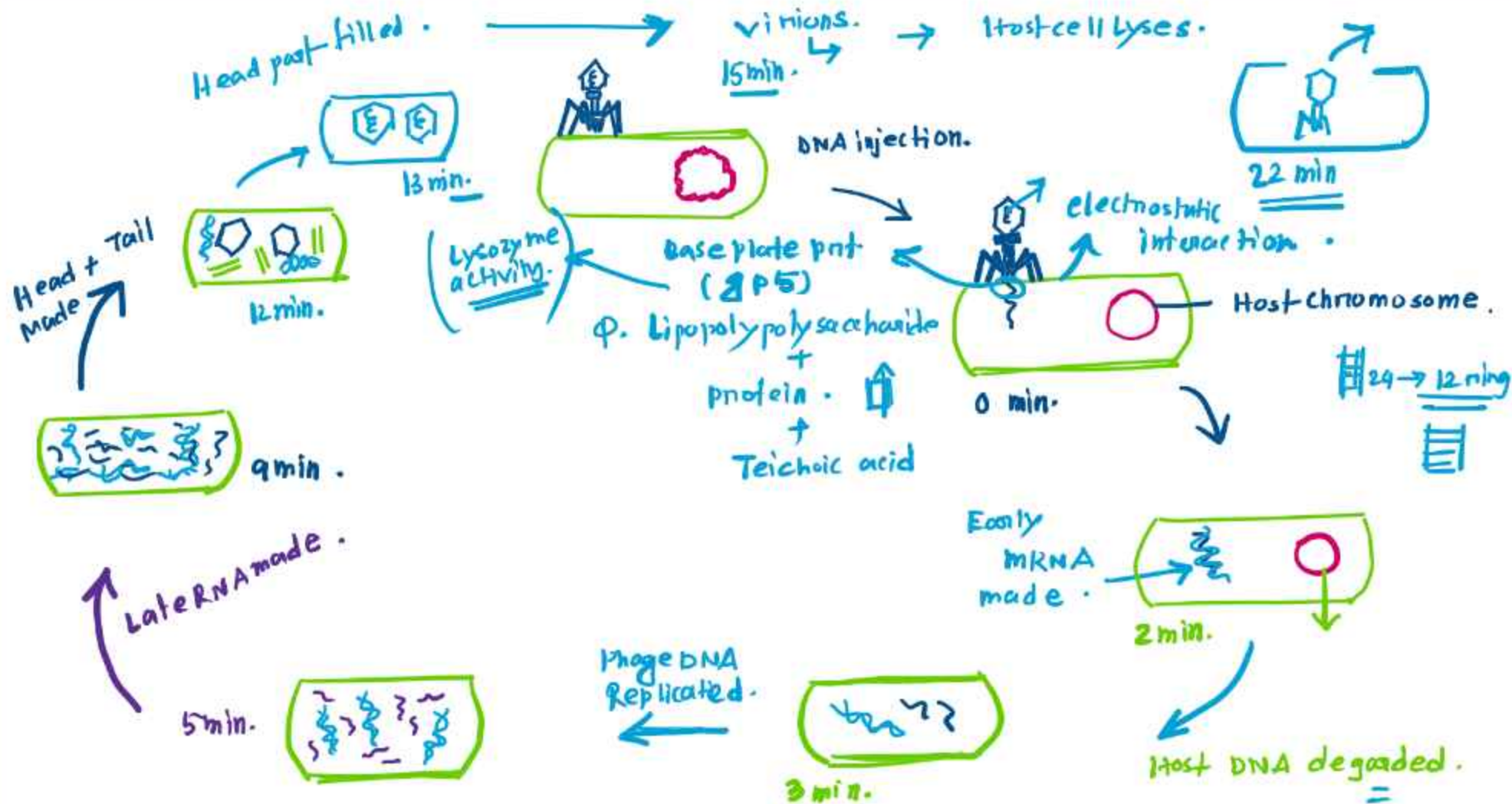
Tail fibres are normally folded around the tail, with their midpoints held by the whiskers on the collar. size of spike is → 260 nm.

- a. attachment. →
- b. penetration. →
- c. synthesis. →
- d. assemble
- e. Release.

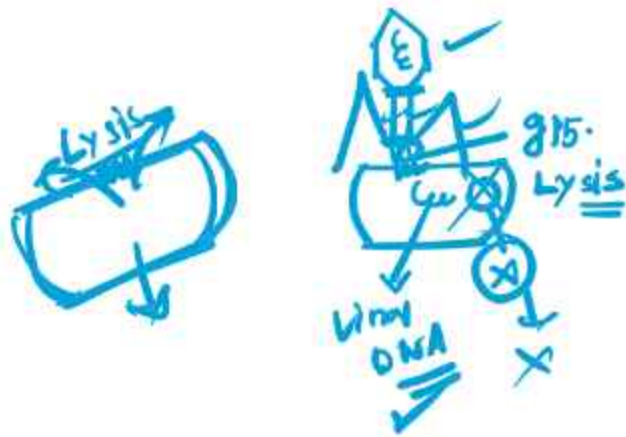


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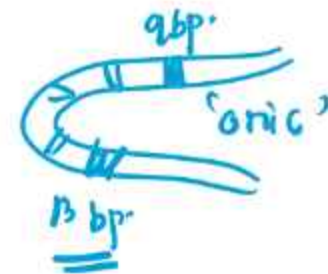


Assembly of phage particle →



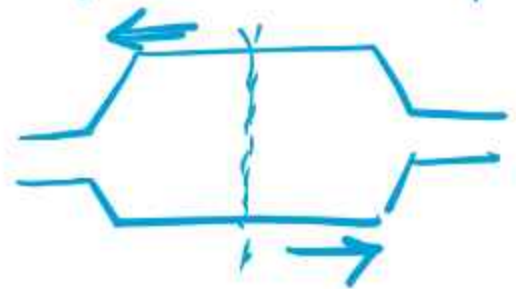
→ 2 min. → polymerase start synthesis → T_q mRNA.

5 min →



Late mRNA

→ bidirectional Rep.



1. phage structural prot.
2. protein that help with phage assembly without becoming part of the virion str.

3. proteins involved in cell lysis and phage release. → 9 min

17.6 →



→ mRNA



→ protein.

④ (76) → Nucleic Acid type

Nucleic Acid
str.

Virus
example

DNA: 1. single stranded

→ 1. Linear, single stranded DNA. e.g. Parvo virus.

2. Circular, single stranded DNA.



e.g. M13
φ x174.

2. Double stranded

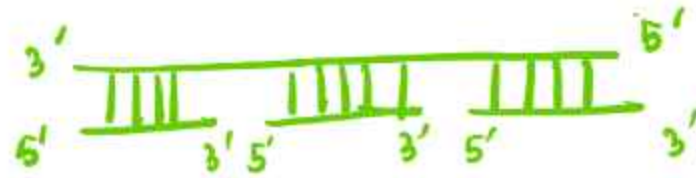
3. Linear double stranded DNA.



e.g. λ phage
Herpes simplex virus
Adeno virus — ④



Double strand : iv) Linear / double stranded DNA with single chain break.



eg. T5 coliphage.

v) Double stranded DNA with cross linked ends.



eg. vaccinia -
small pox virus.

vi) closed, circular,
ds DNA



eg. papilloma virus -
cauliflower mosaic
virus → CMV ⊕

Nucleic Acid type.

RNA .
single stranded →

Nucleic acid structure

I> Linear, single stranded,
positive strand RNA.

++++

Virus example

e.g. polio virus -
TMV
bacteriophage.

II> Linear, single str., neg. str. RNA

e.g. Rhabdovirus
(Rabbies)

Paramyxovirus -
(Mumps).

III> Linear, single strand,
segmented, positive strand
RNA .

+ - - - -

e.g. Brome
mosaic virus
(BMV)

IV> Linear, ss, diploid, + str.
abcde efg abcde efg

e.g. Rous sarcoma
virus .
Retro virus .

v) Linear, ss, segmented,
negative str. RNA.

e.g. paramyxovirus
Influenza virus.

⊖ — — — —

Double strand. vi) Linear, ds, segmented
RNA.

e.g. Reovirus.
phage X6.

== == ==

φ. ④ Bromo mosaic virus →

φ. Virus discovered by → Adolf Mayer.

φ. TMV Crystallized by → Stanley.

φ. TMV → RNA.

φ. T even → T₂, T₄, T₆.

↓
Lytic phage.

(virulent phage)

Todd → avirulent
T₁, T₃, T₅.