



Rai Technology University

ENGINEERING MINDS

VIRUSES

By

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Viral Shape and Symmetry

- ✓ Nucleic Acid – DNA / RNA

 - DNA Virus – Simplest , use host RNA polymerase and make mRNA

 - RNA Virus – Use their own RNA Polymerase to make mRNA

- ✓ Protein Coat

 - Capsid, capsomeres

- ✓ Lipid Membrane

 - Enclose nucleocapsid and is obtained from host during the replication process

 - Contains viral – specified protein

 - ✓ Polyhedral

 - Eg., Adenovirus

 - ✓ Helical

 - Eg., TMV, Bacteriophage M13

 - ✓ Enveloped Virus

 - Eg., Influenza, Herpes Virus

 - ✓ Complex

 - Eg., Bacteriophage



Classification of virus

1. Type of Nucleic acid
2. Symmetry of the protein shell
3. Presence / absence of lipid membrane
4. Dimension / size of the virion and capsid

Taxonomy of Virus

Order – Virales

Family – Viridae

Sub family –
Virinae

Genus – Virus

Species – Virus



Baltimore Classification

Group I → Possess *ds* DNA – *Herpesvirus*

Group II → *ss* DNA – *Parvovirus*

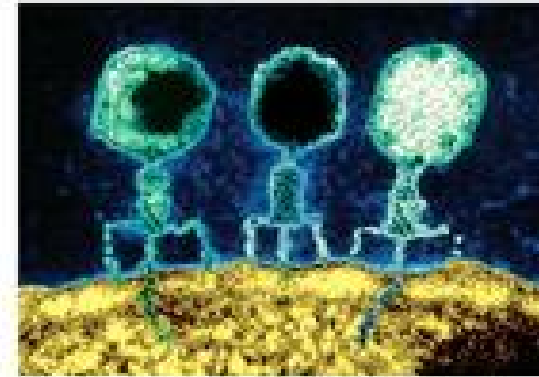
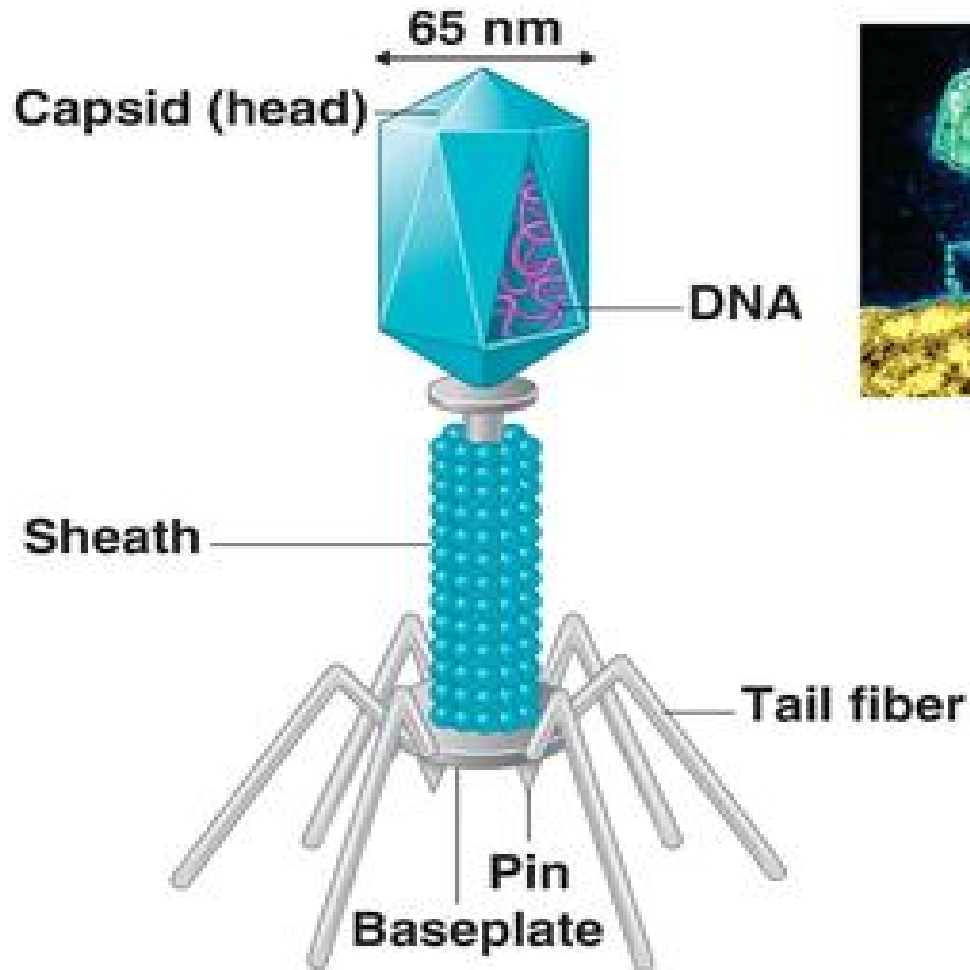
Group III → *ds* RNA – *Reovirus*

Group IV → *+ve ss* RNA – *Picornavirus*

Group V → *-ve ss* RNA – *Rhabdovirus*

Group VI → *-ve ss* RNA with reverse transcriptase that converts RNA to DNA - *HIV*





TEM 40 nm

(a) A T-even bacteriophage

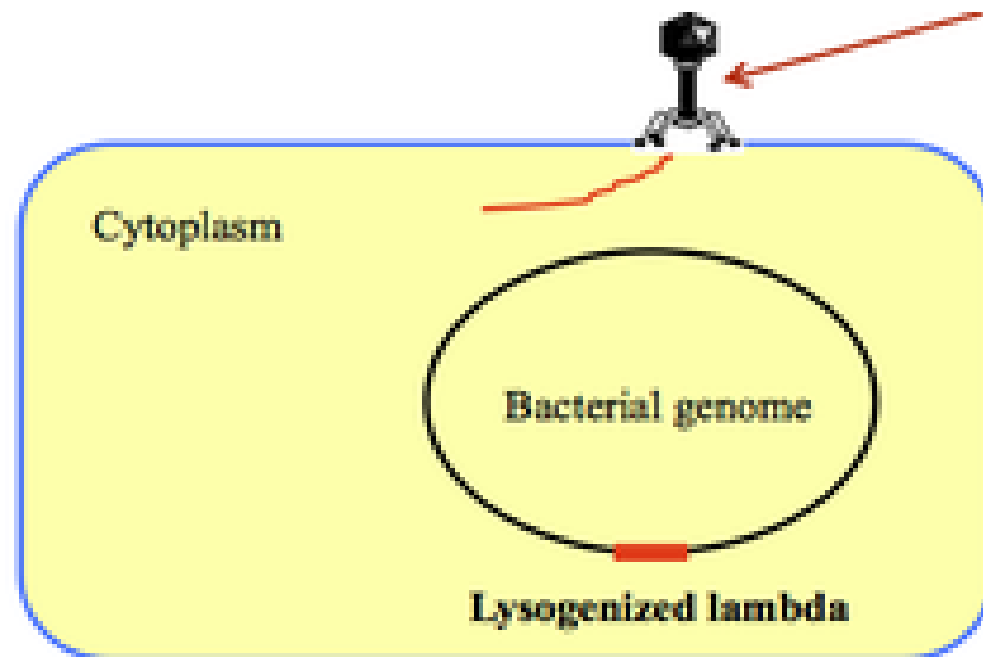
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- Bacteriophage was first observed in 1915 by T. Wort and in 1971 by F. d' Herelle
- D' Herelle used the term bacteriophage (eaters of bacteria)
- Complex phages have polyhedral heads to which tails and other appendages (tail plates, tail fibers) are attached
- Phage T4 is an example of a complex phage
- It contains a linear double stranded DNA genome (172 kb) enclosed in a capsid and attached to a tail
- It has a very elaborate tail structure including a collar at the base of the head and rigid core surrounded by a contractile sheath
- The core and sheath are attached to a hexagonal base plate
- Attached to the tail plate are tail pins and six linked tail fibers

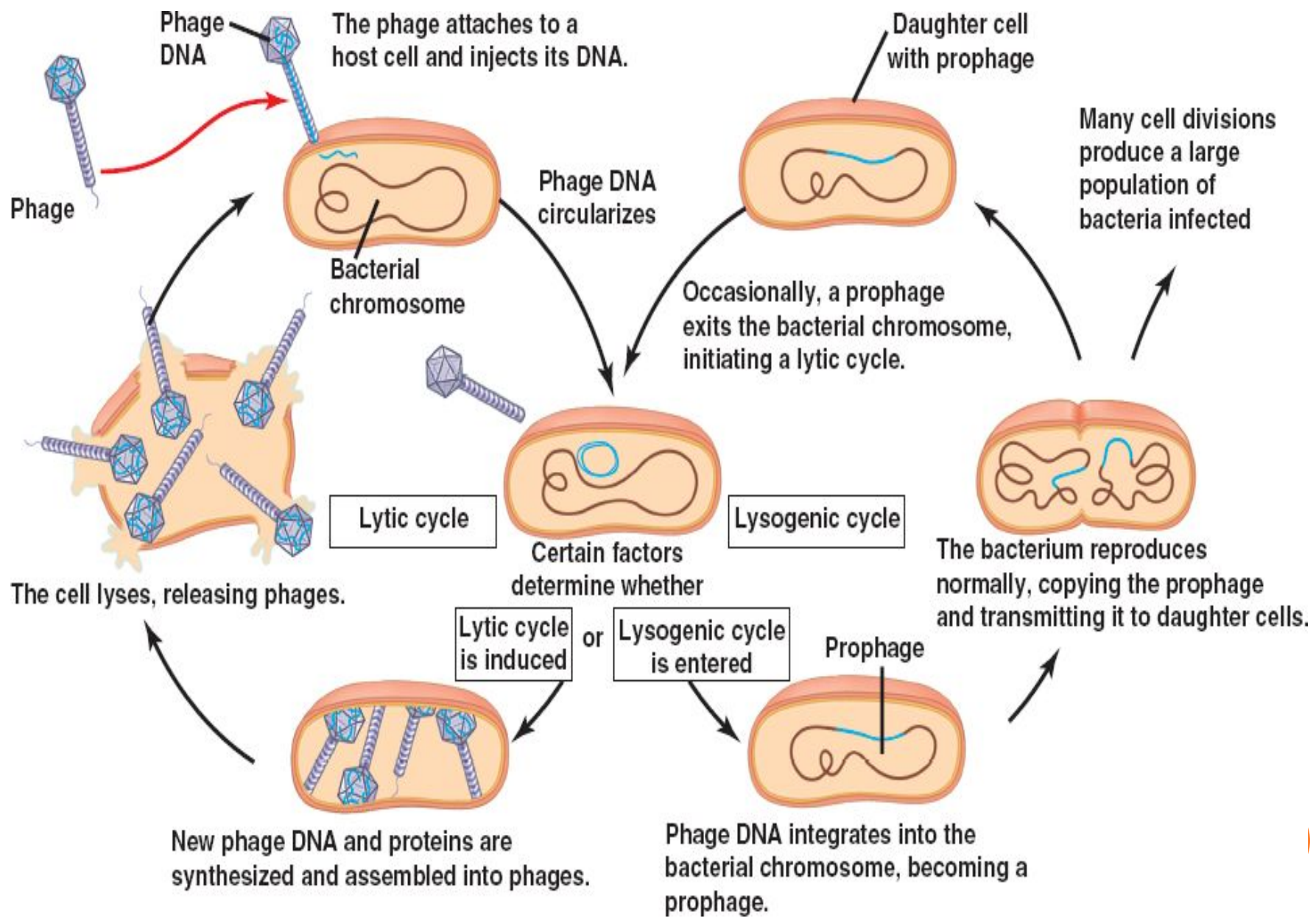


Phage Conversion



E. coli with lysogenized lambda





THANK YOU

