

VIRUS

→ particle of genetic material and protein → invade living cells

- not cells, but pathogen-agents
- they do NOT METABOLIZE

1935 Stanley finds purified TOBACCO MOSAIC VIRUS

Structure

- CAPSID (COAT): protein
- DNA OR RNA (never both)
- MEMBRANE (envelope): surrounding the capsid
proteins, lipids and glycoprotein

Bacteriophages viruses
are complex



Reproduction → V. rely on living cells for replication

Adeno viruses

- non enveloped
 - icosahedral capsid
 - DNA
- } mostly respiratory illness, not serious

RNA viruses

→ Ebola, polio, influenza, hepatitis C, pneumonia

Retroviruses

includes DNA
in their replication
cycle

HIV

ENVELOPED

- enzyme reverse transcriptase
↓
obtain DNA from RNA
(only viruses can do this)
- enzyme Integrase

Ribo viruses

Lytic Cycle

- viruses use host cell to replicate themselves
(proteins, nucleic acid, etc)
- they assemble
- they are released

ONLY BACTERIOPHAGES dna viruses

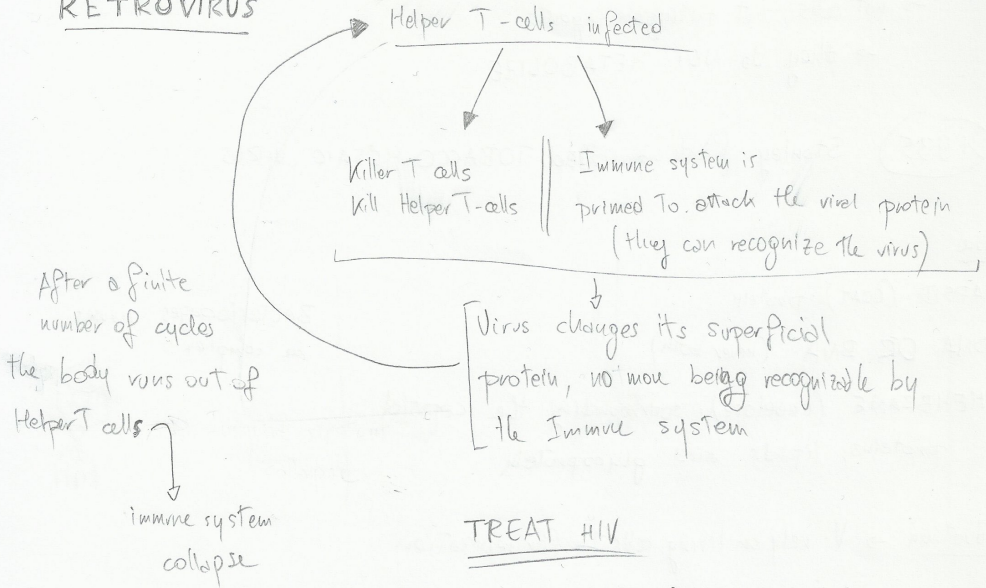
Lysogenic cycle

- instead of destroying the cell
the virus inserts itself in the
host's DNA, to be replicated
together with the cell
(provirus)

HIV

→ ^{parasitizes} T-cells and macrophages → kills them to reproduce itself

RETROVIRUS



TREAT HIV

- inhibitors of
 - reverse transcriptase
 - protease (produces final viral proteins)
 - fusion
 - integrase.

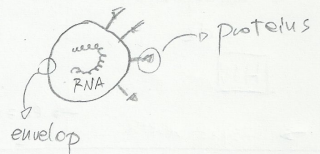
MULTI-DRUG COCKTAILS

HART (3 diff. drugs)

Corona V.

RETROVIRUS

→ airborne droplets to the nasal mucosa

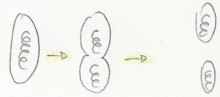


BACTERIA

→ Binary fission

asexual reproduction

all prokaryotic organisms can do this



→ Conjugation

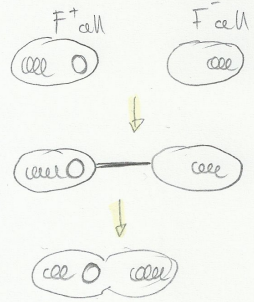
first form of sexual reproduction

transfer of genetic material → PLASMID

benefits can include antibiotic resistance

sex pilus

cellular structure
that allows the connection
between cells



the plasmid can be integrated
within the chromosome (Hfr cell)

→ Transduction

through a VIRUS (or viral vector) → lab

Lytic cycle → bacterial DNA inserted within the capsid
errors

Lysogenic cycle → part of bacterial DNA remains attached to
the VIRAL RNA

↓
Viruses with some bacterial DNA, that can go within
others bacteria

→ Transformation

Incorporation of exogenous DNA (maybe after the death of
others bacteria)

↳ free near bacterium, in
the environment

Often done in laboratory

SPORE → tough

→ bacteria surround themselves with a coat of protein

→ survive in hostile conditions

→ remains dormant

botulism, tetanus

SYMBIOSIS → two species living together for life

Human body carries 100 trillion bacteria → GUT BACTERIA
(Flora bacteria)

GUT
MICROBIOTA

PARASITISM → Bacteria exploits the host cell, injuring it

PATHOGENIC BACTERIA

- tuberculosis
- tetanus
- diphtheria
- syphilis