

Viruses



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medpathwaymcat



Med-pathway

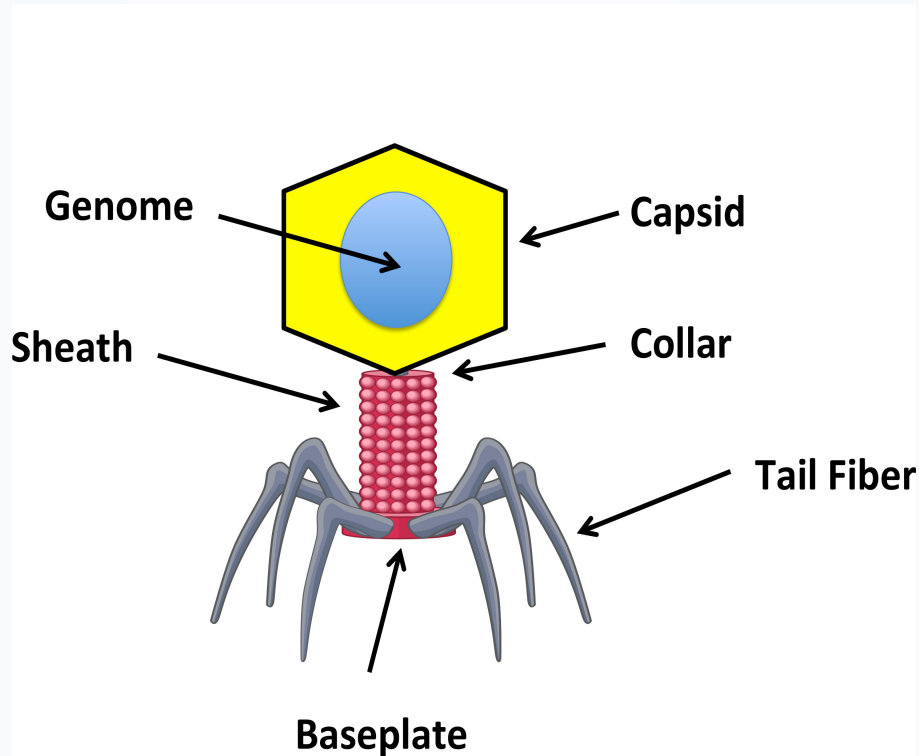


MED-PATHWAY.COM

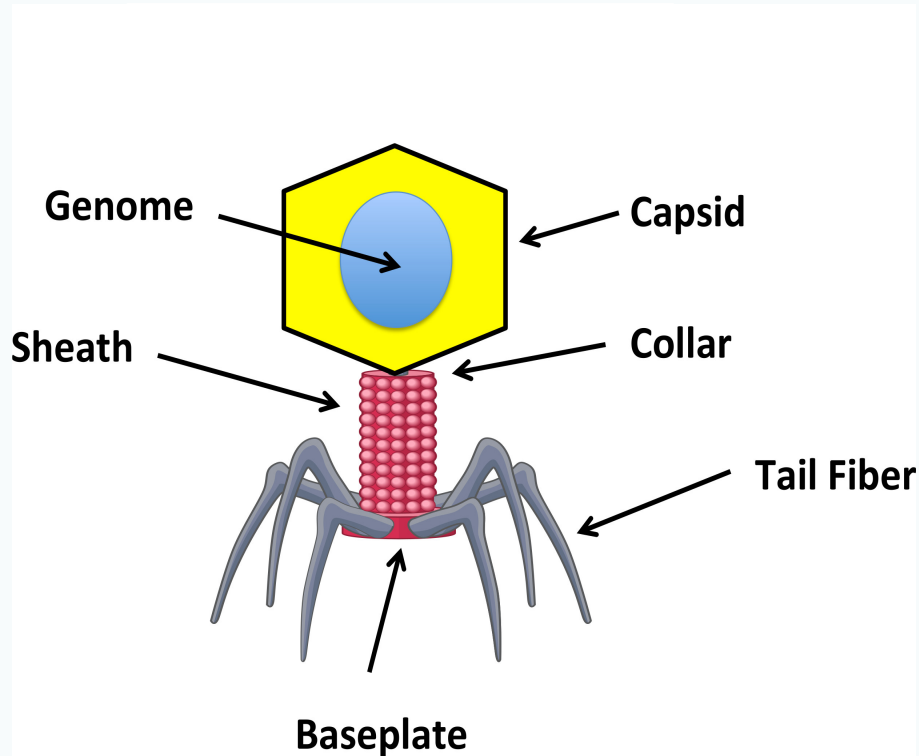
The advertisement features a female doctor in a white lab coat with a stethoscope, holding a small white pill in her right hand. The background is dark with faint molecular structures. The text 'MED-PATHWAY.COM' is overlaid in large, bold letters, with 'MED-' in white and 'PATHWAY.COM' in blue.

Your online MCAT Prep testing center developed
by medical school professors

Bacteriophage



Bacteriophage

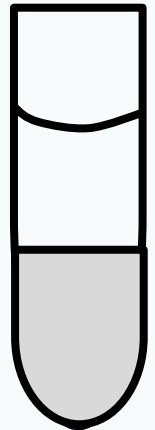


Extraction in
Phenol

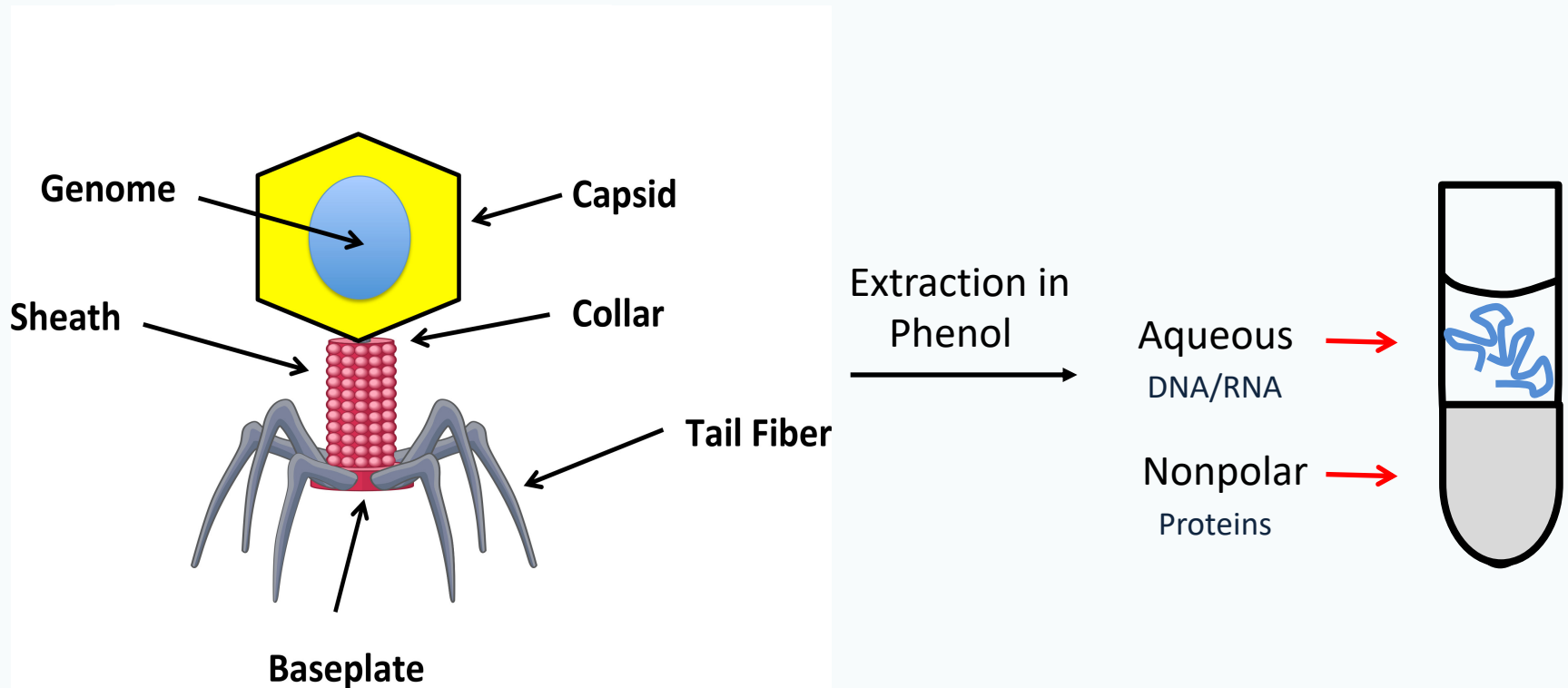
→

Aqueous →

Nonpolar →



Bacteriophage



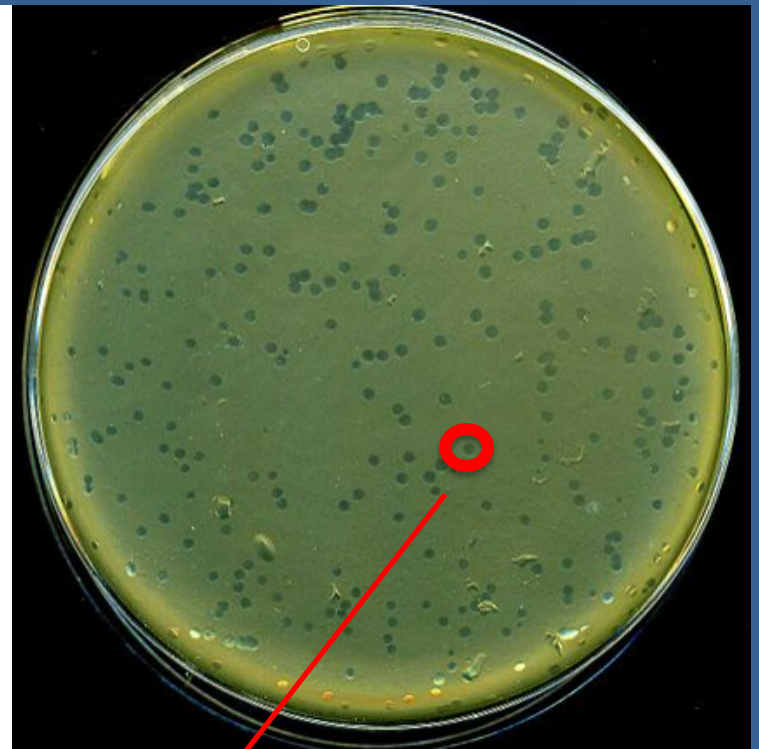
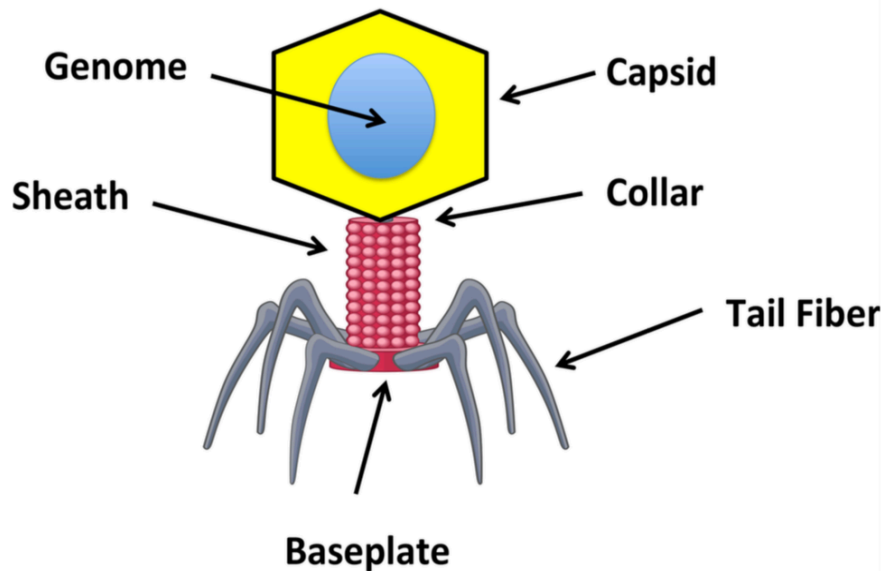
VIRAL ASSAYS

Infect Cells w/ Virus



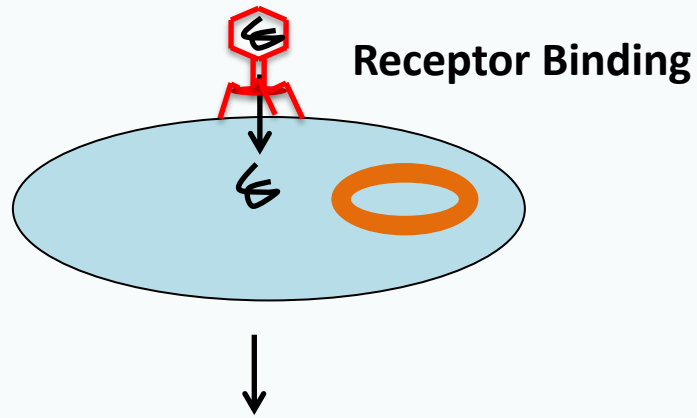
Plate out with cells on agar plate

Bacteriophage Structure

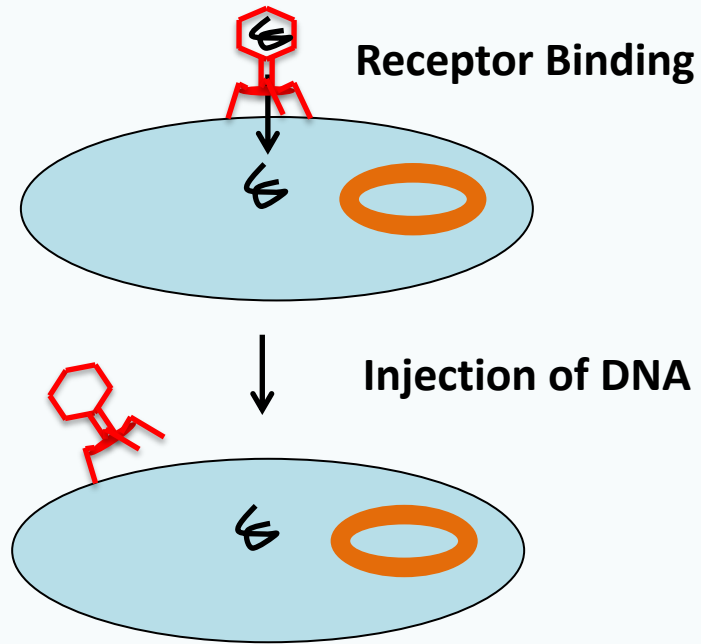


**Viral Plaques = lysed or slowly growing cells:
Quantitate to determine efficiency of infection**

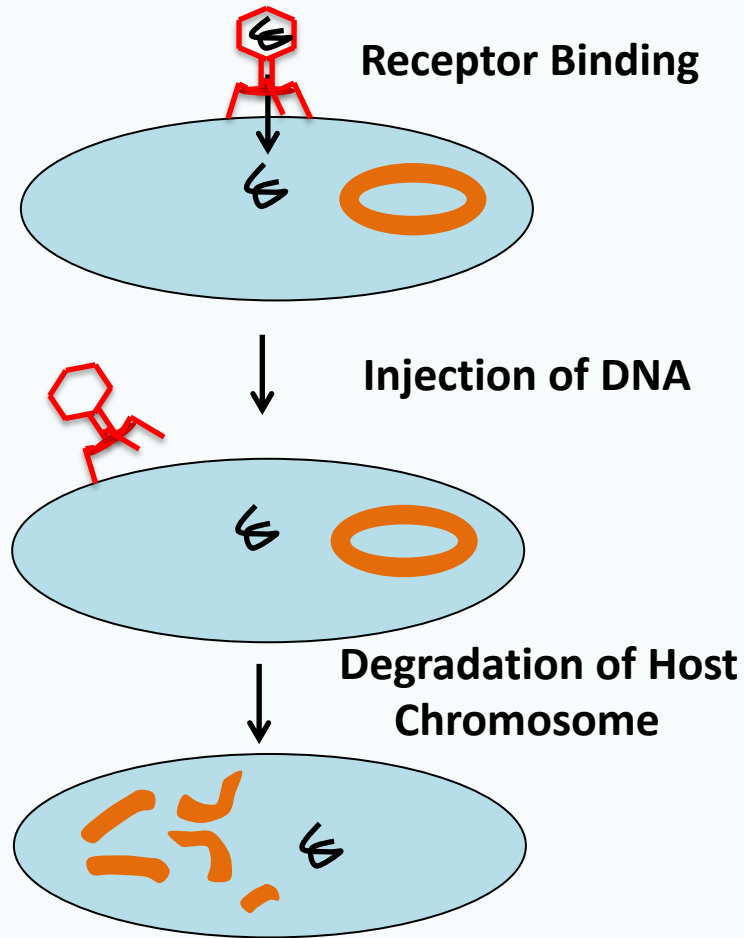
VIRAL LIFE CYCLES



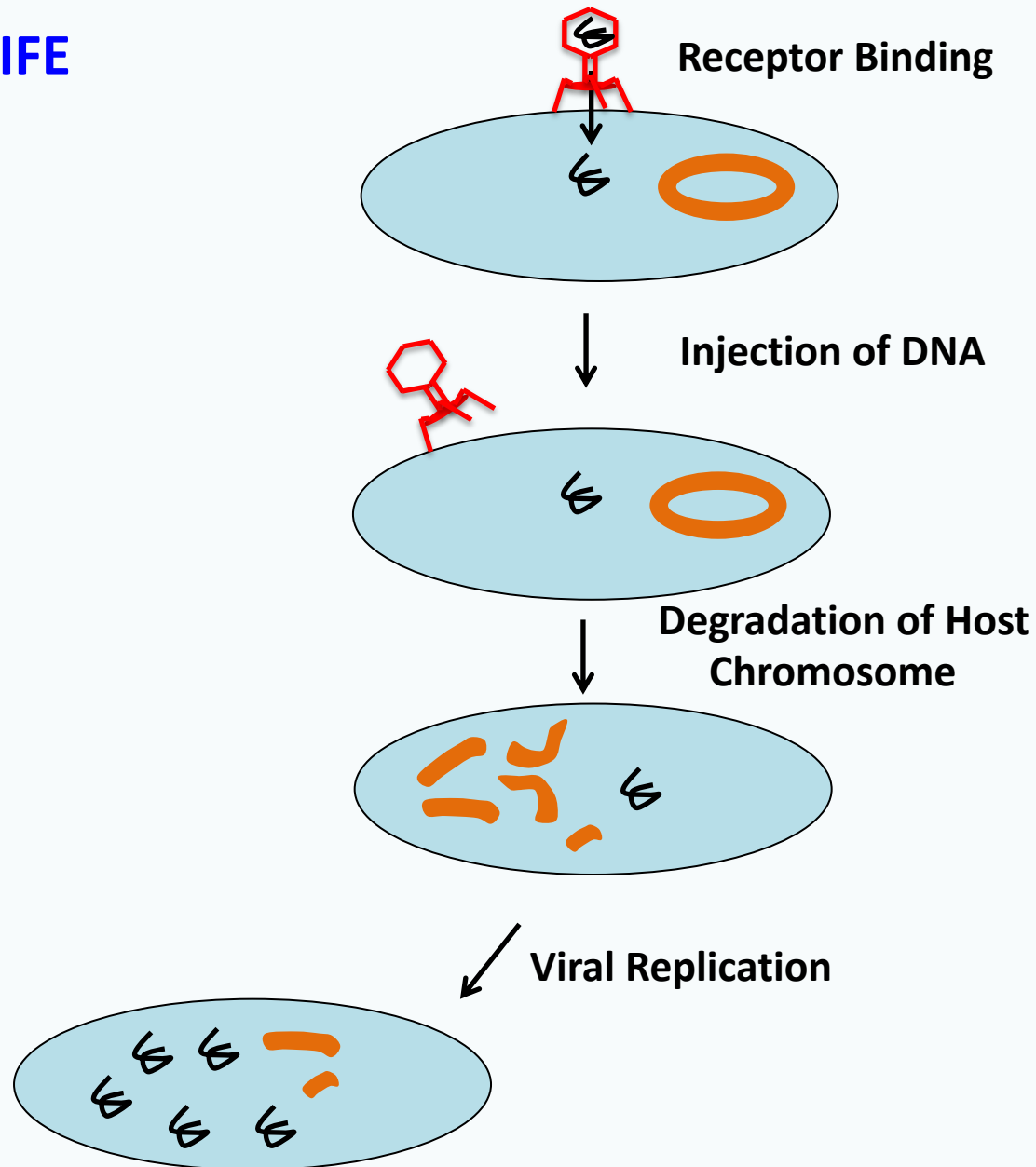
VIRAL LIFE CYCLES



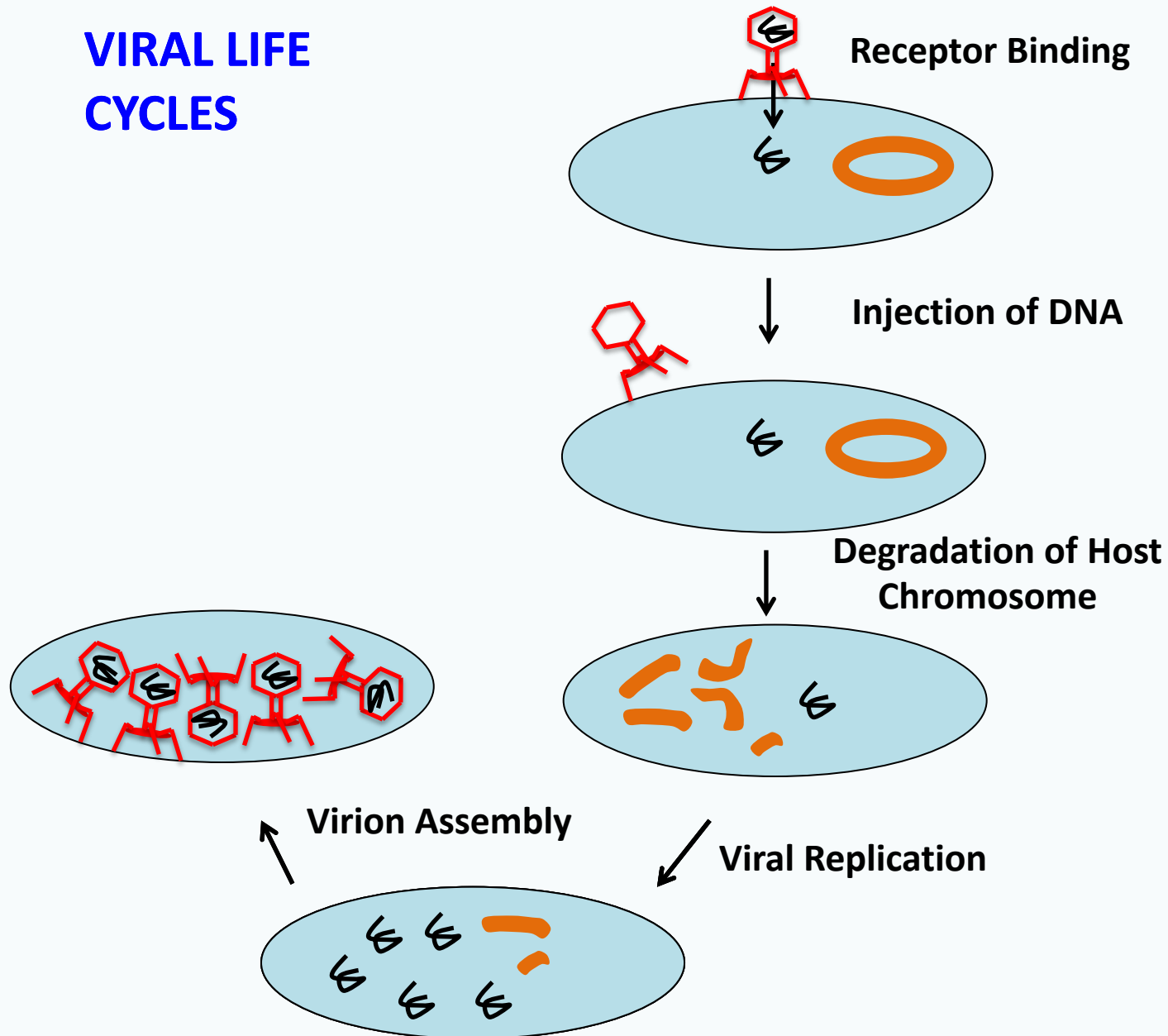
VIRAL LIFE CYCLES



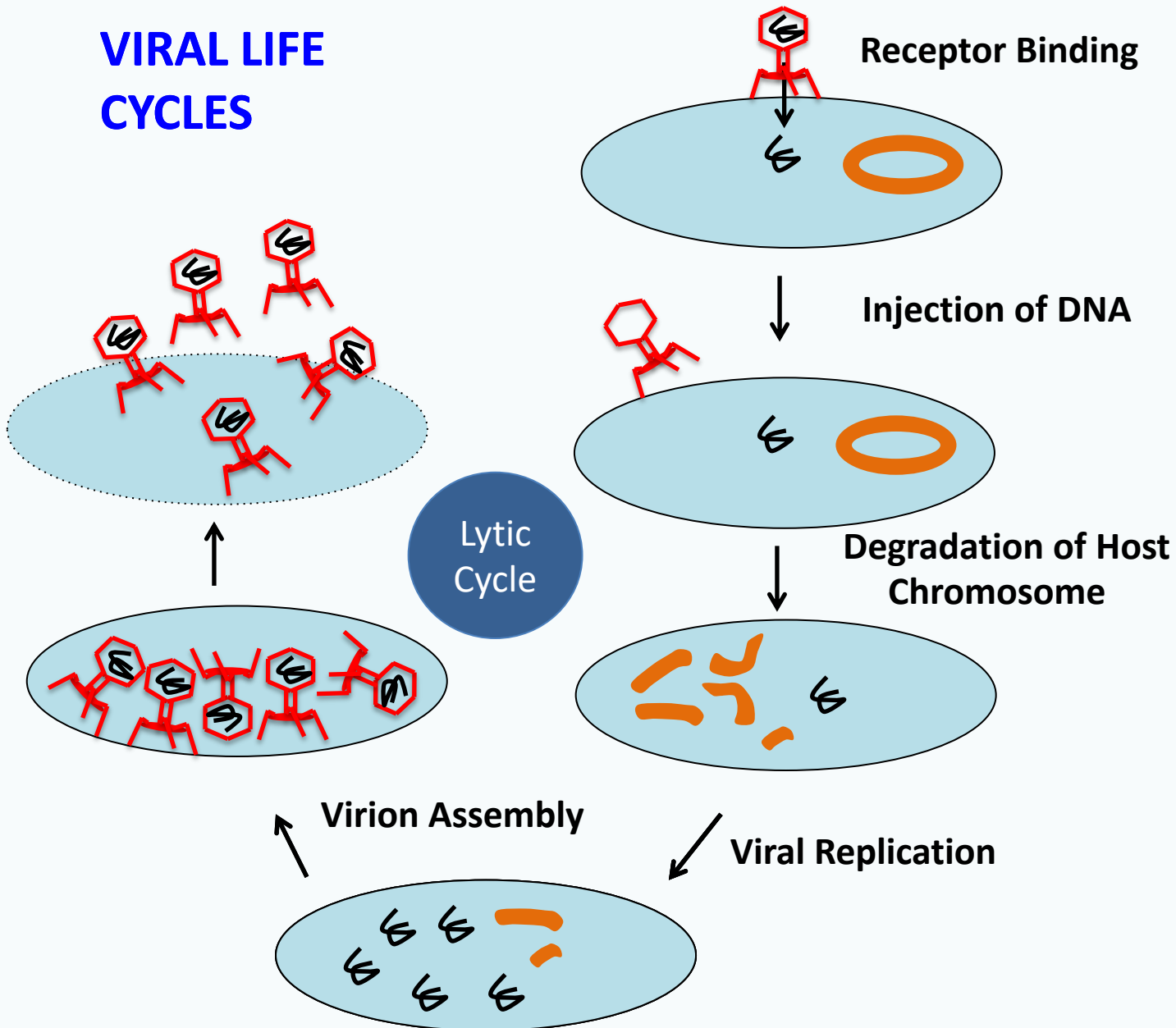
VIRAL LIFE CYCLES



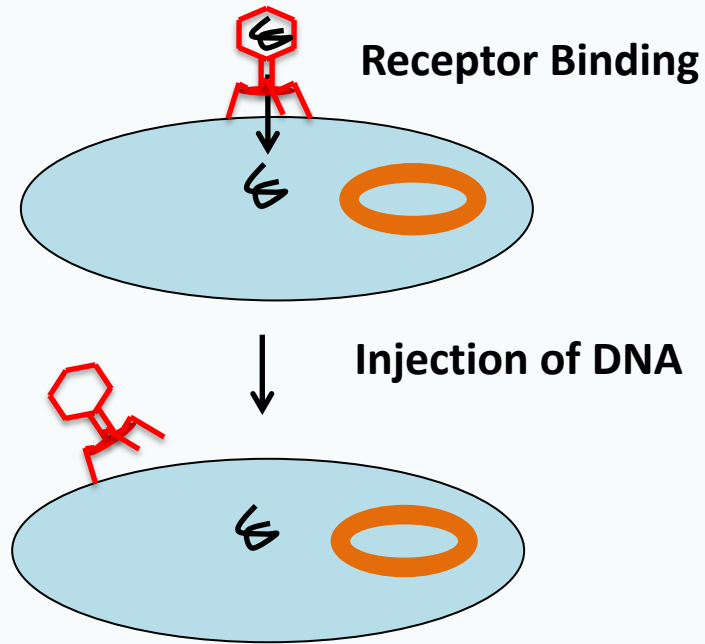
VIRAL LIFE CYCLES



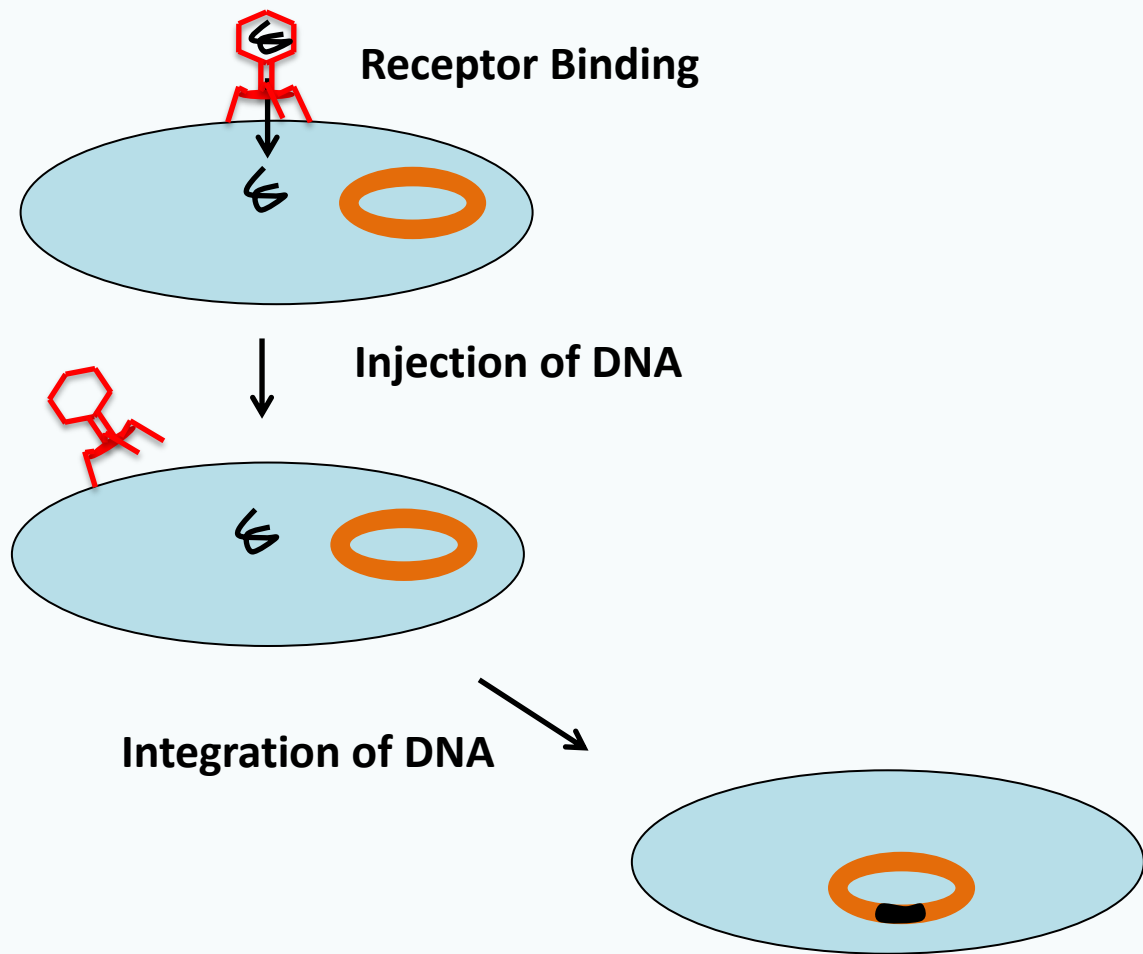
VIRAL LIFE CYCLES



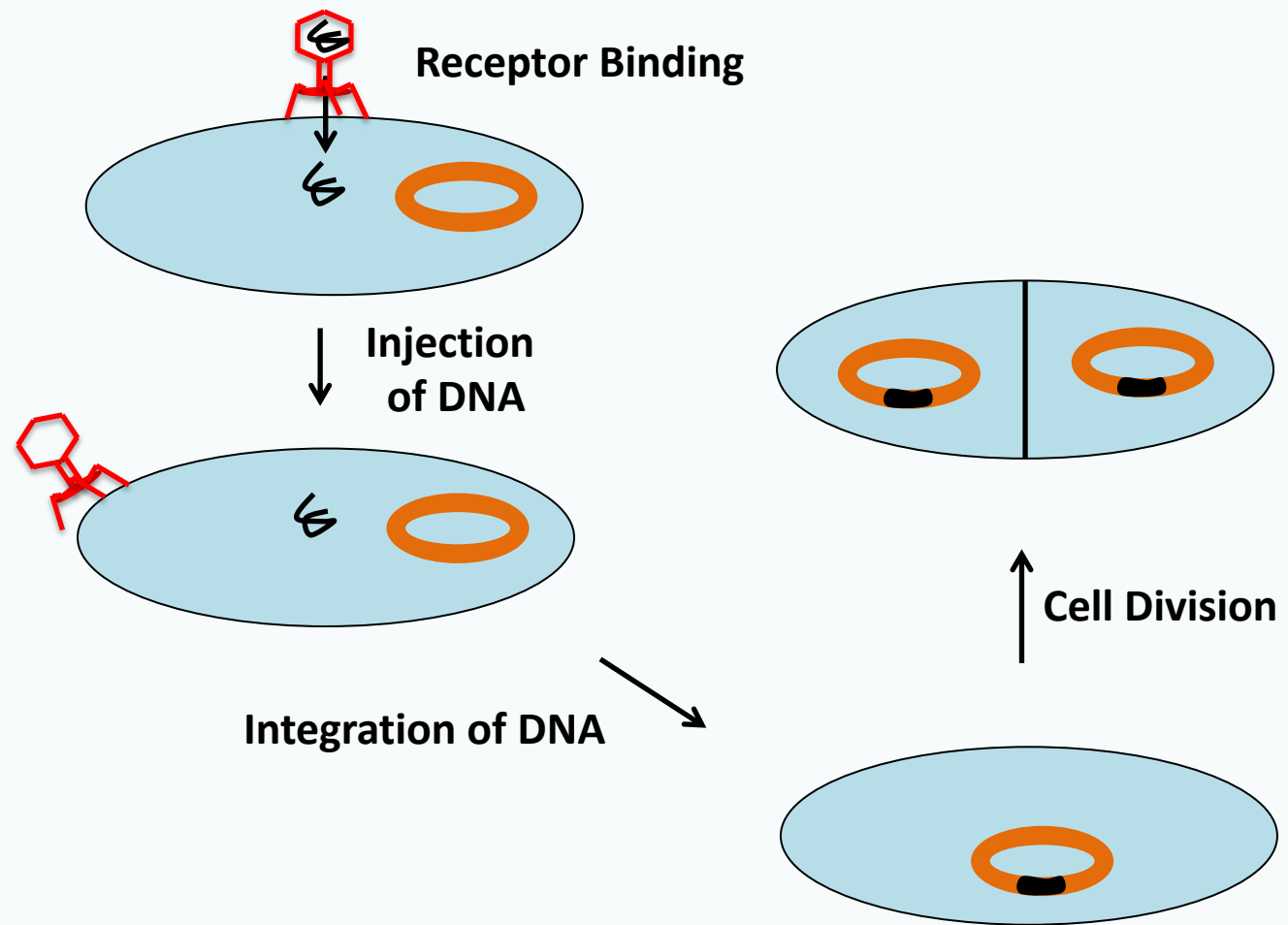
VIRAL LIFE CYCLES



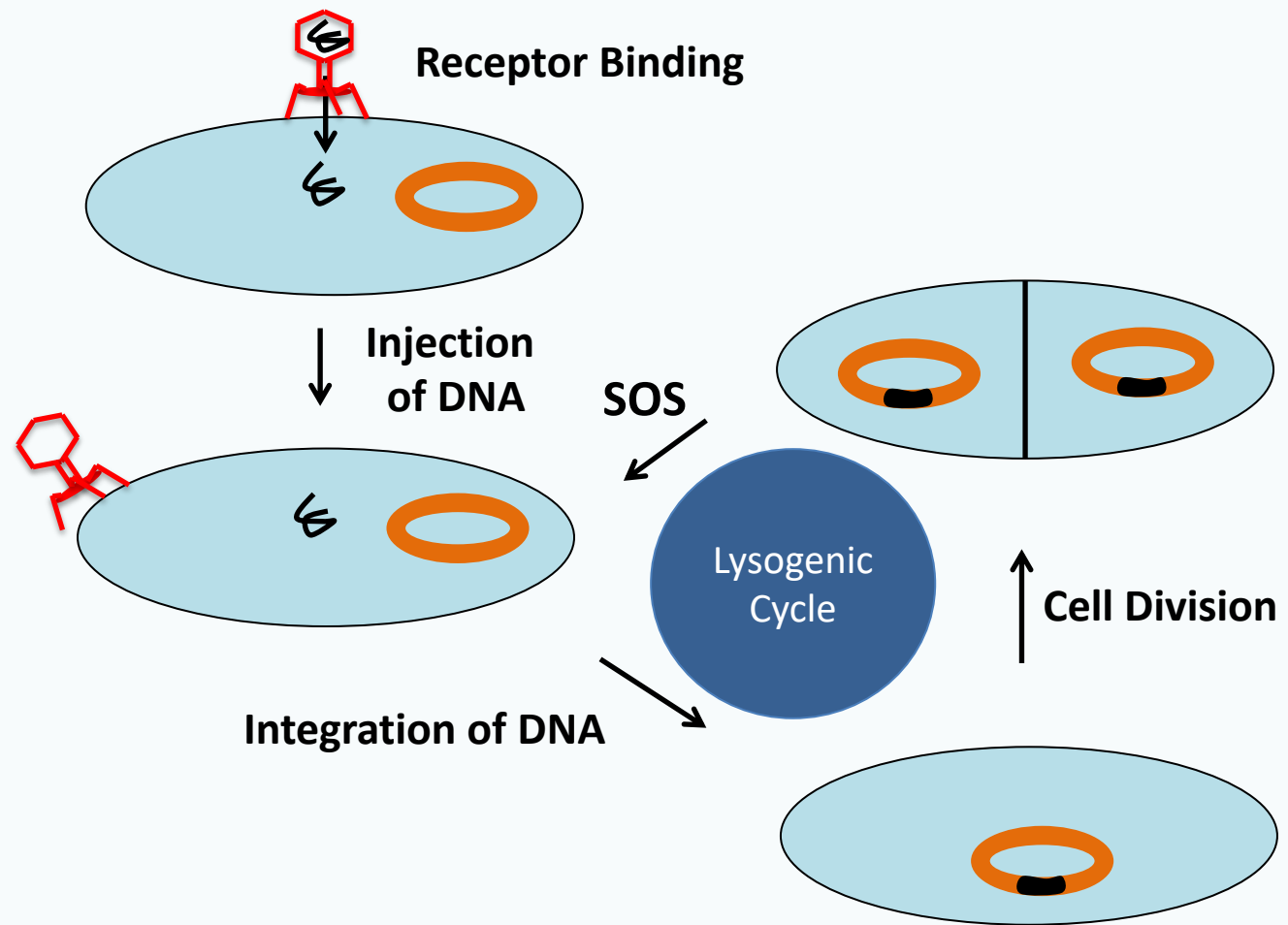
VIRAL LIFE CYCLES



VIRAL LIFE CYCLES

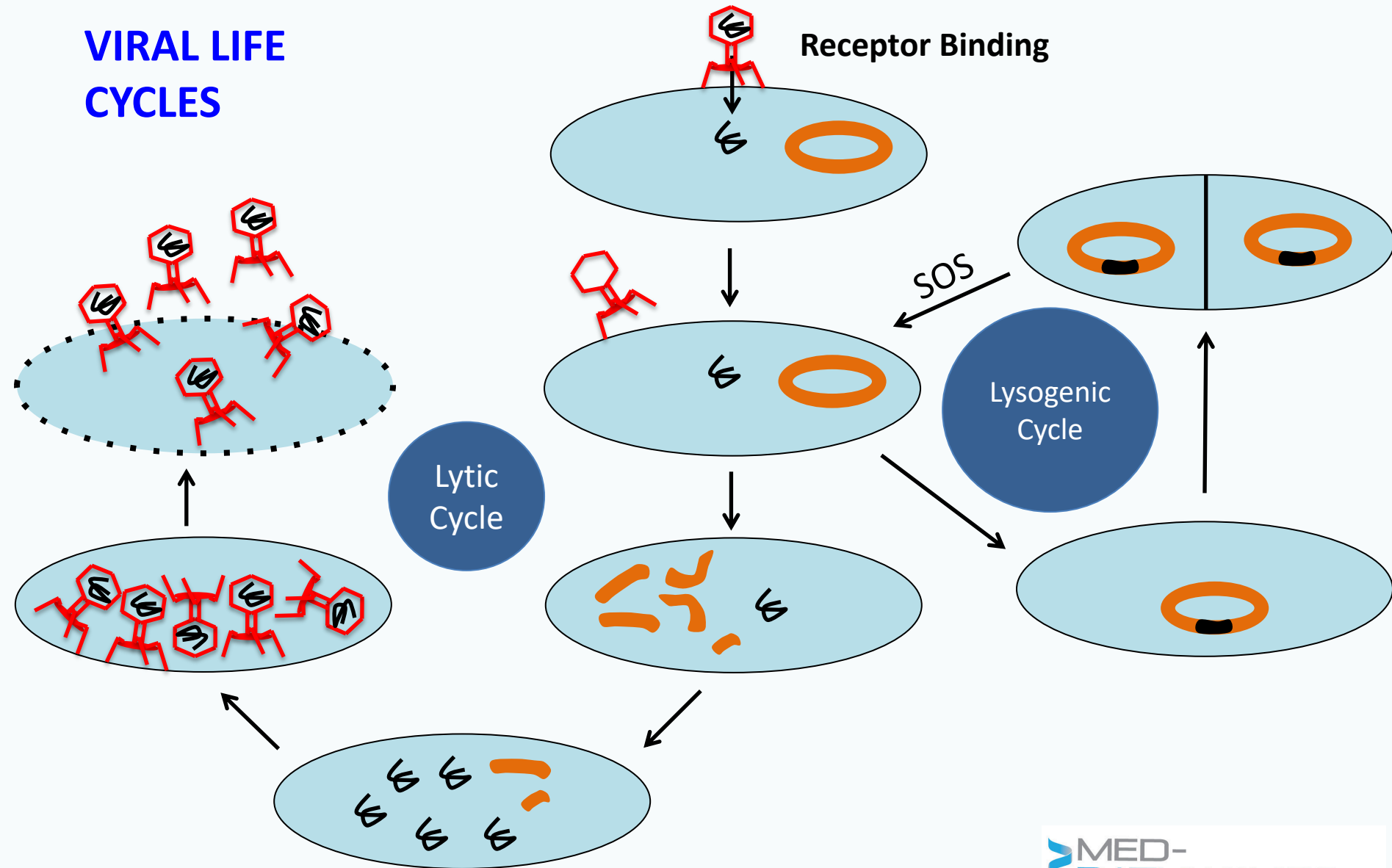


VIRAL LIFE CYCLES



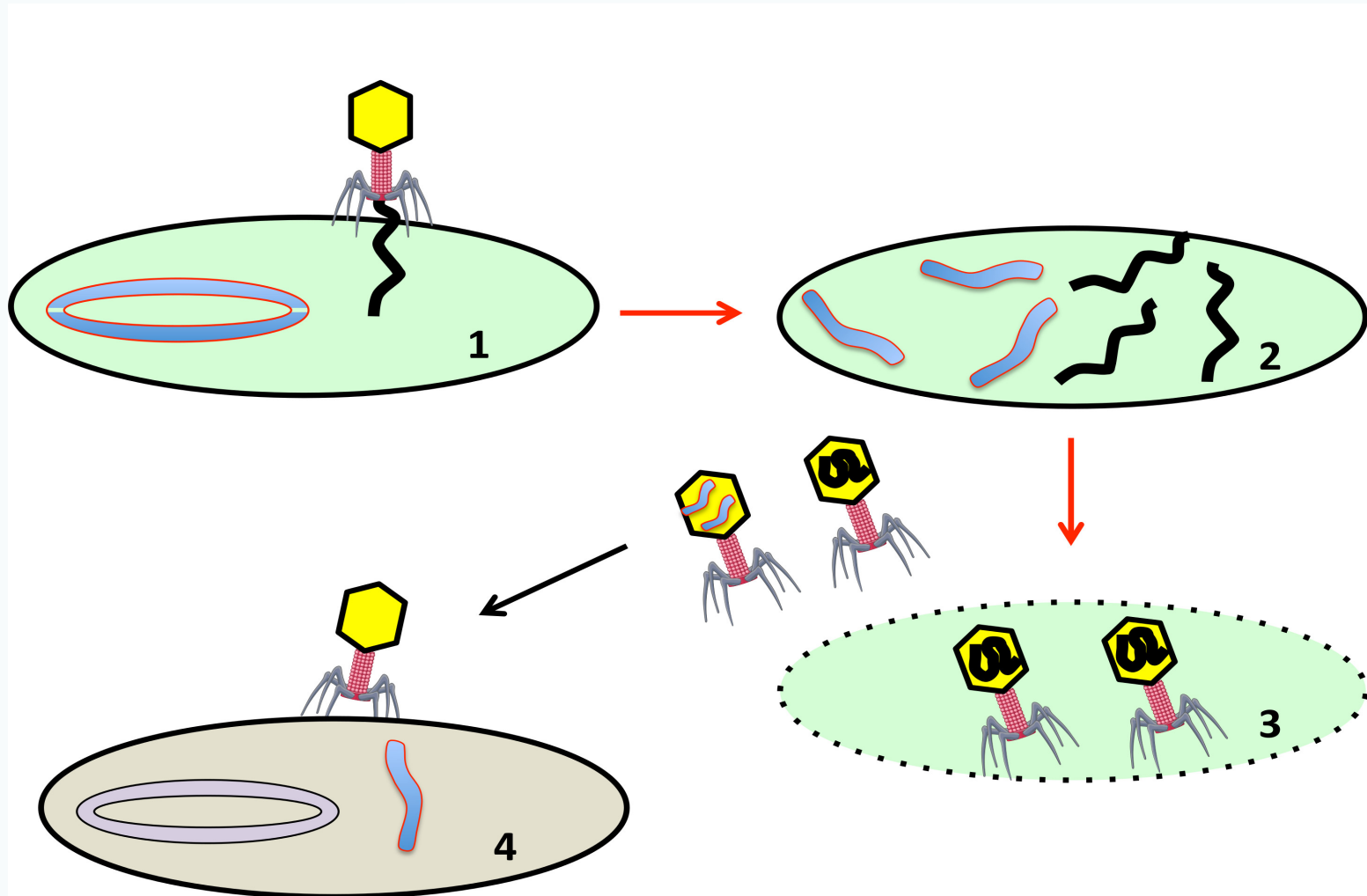
Lytic and Lysogenic Cycles

VIRAL LIFE CYCLES



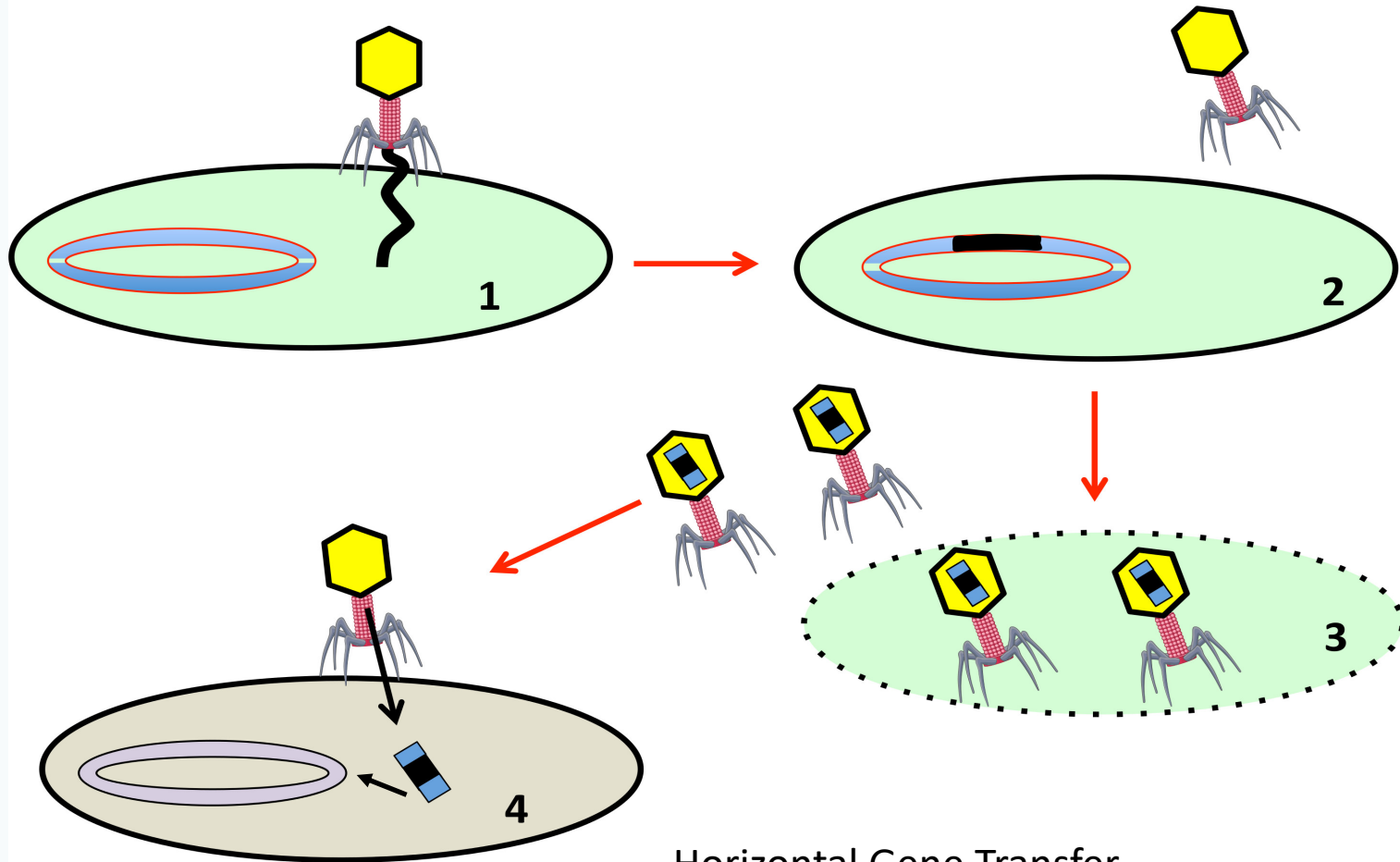
Generalized Transduction

LYTIC PHASE



Specialized Transduction

Lysogenic State

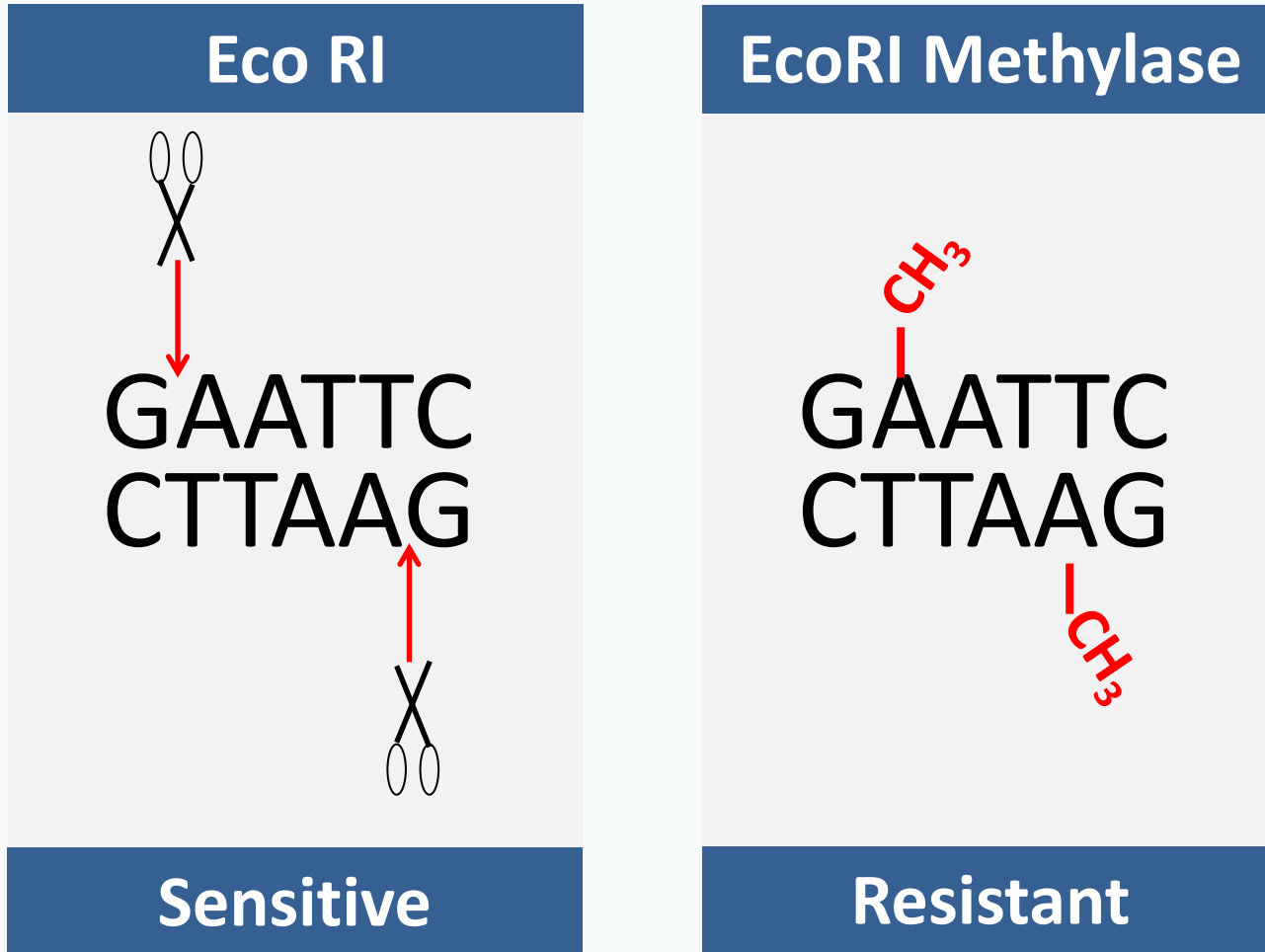


Creates Partial Diploids

Horizontal Gene Transfer

Host Restriction Modification Systems

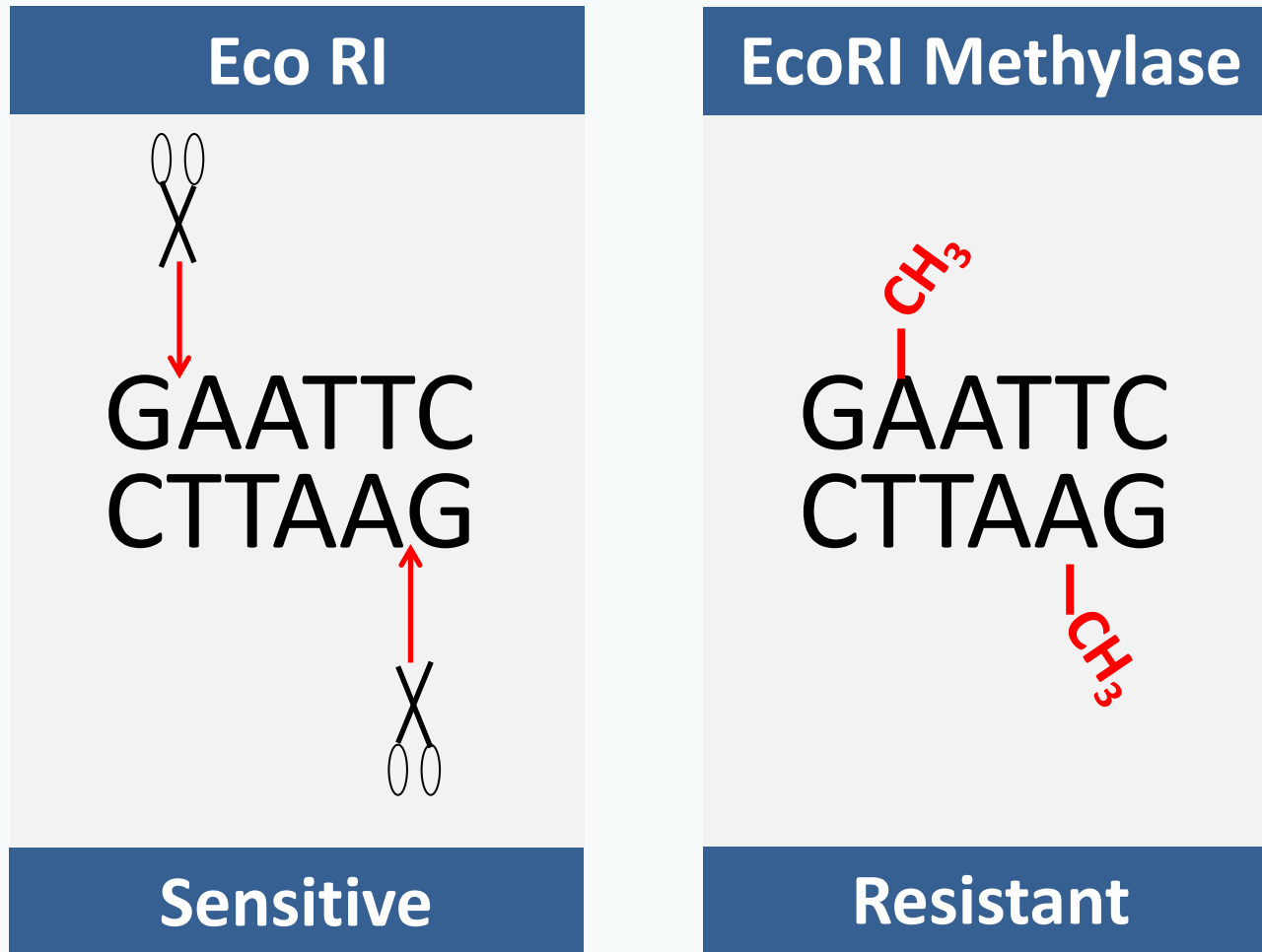
Constitutive



Methylation defines “self vs non-self”

Q: What is the relationship b/t EcoRI & EcoRI Methylase?

Host Restriction Modification Systems

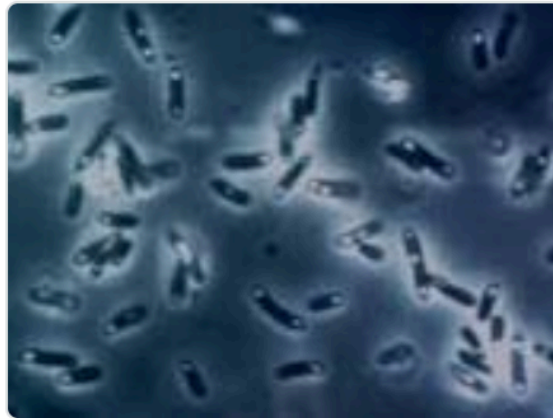
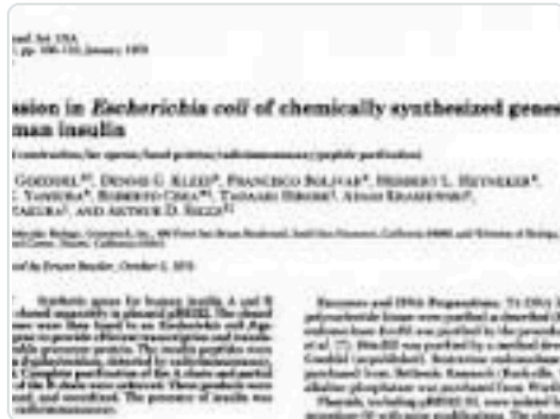


Methylation defines “self vs non-self”

Q: What is the relationship b/t EcoRI & EcoRI Methylase?

Isoschizomers

The Birth of Biotech



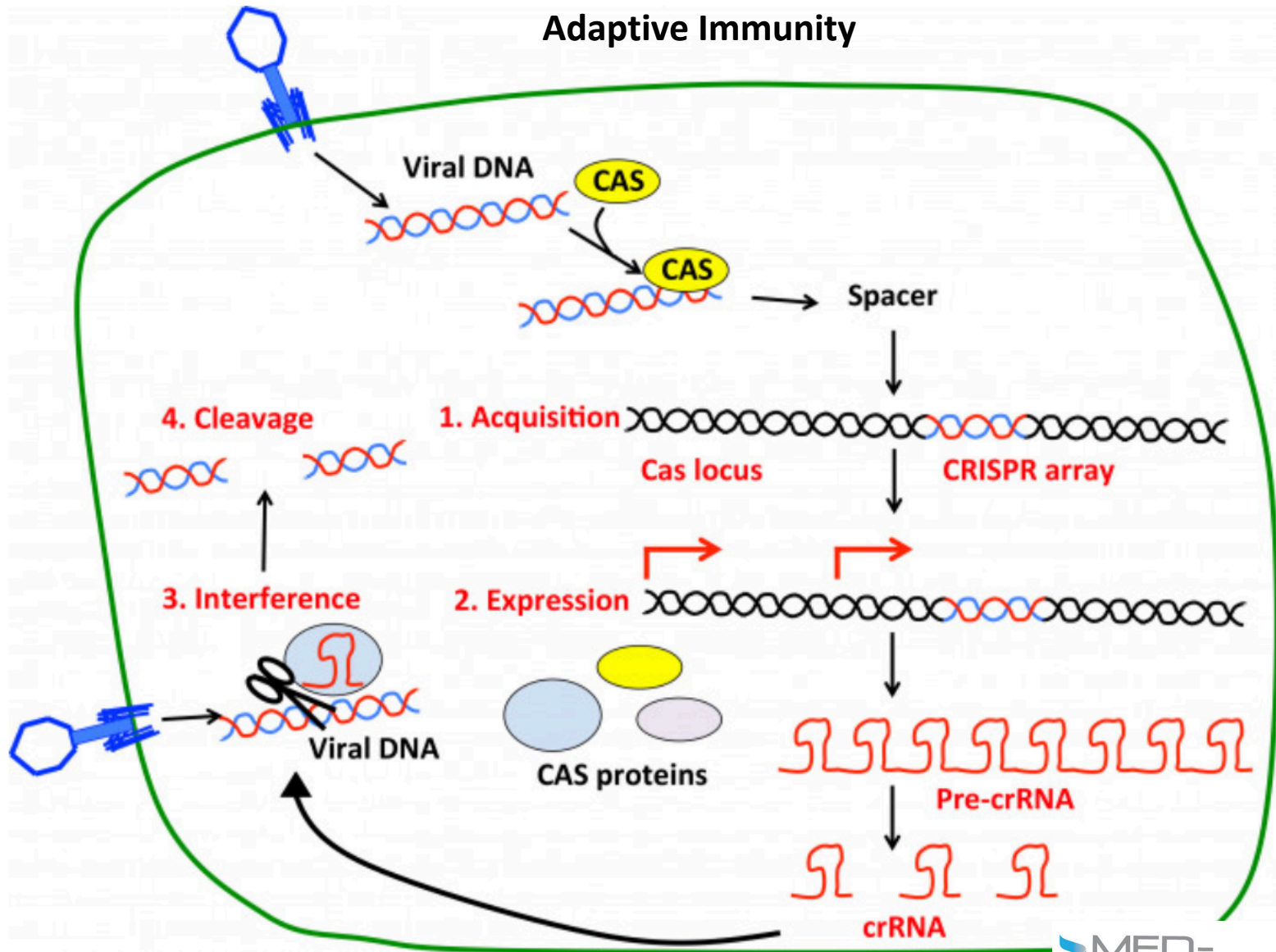
Genentech had the expertise to make synthetic human **insulin**—in laboratories, from bacteria, using their recently-proven **recombinant DNA technology**. ... The scientists would have to coax the bacteria to produce **insulin** from the synthetic DNA at high enough concentrations to make an economically viable product.

Restriction Enzymes!!

CRISPR CAS

Clustered Regularly Interspaced Short Palindromic Sequences

Adaptive Immunity



The Nobel Prize in Physiology or Medicine 1978



Werner Arber



Daniel Nathans



Hamilton O. Smith



NOBELPRISET I KEMI 2020
THE NOBEL PRIZE IN CHEMISTRY 2020



KUNGL.
VETENSKAPS
AKADEMIEN
THE ROYAL SWEDISH ACADEMY OF SCIENCES



Emmanuelle Charpentier

Born in France, 1968

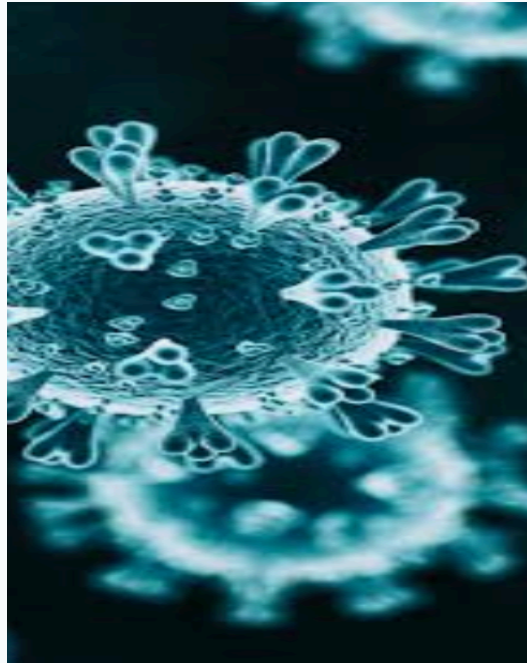
Max Planck Unit for the Science of
Pathogens, Germany



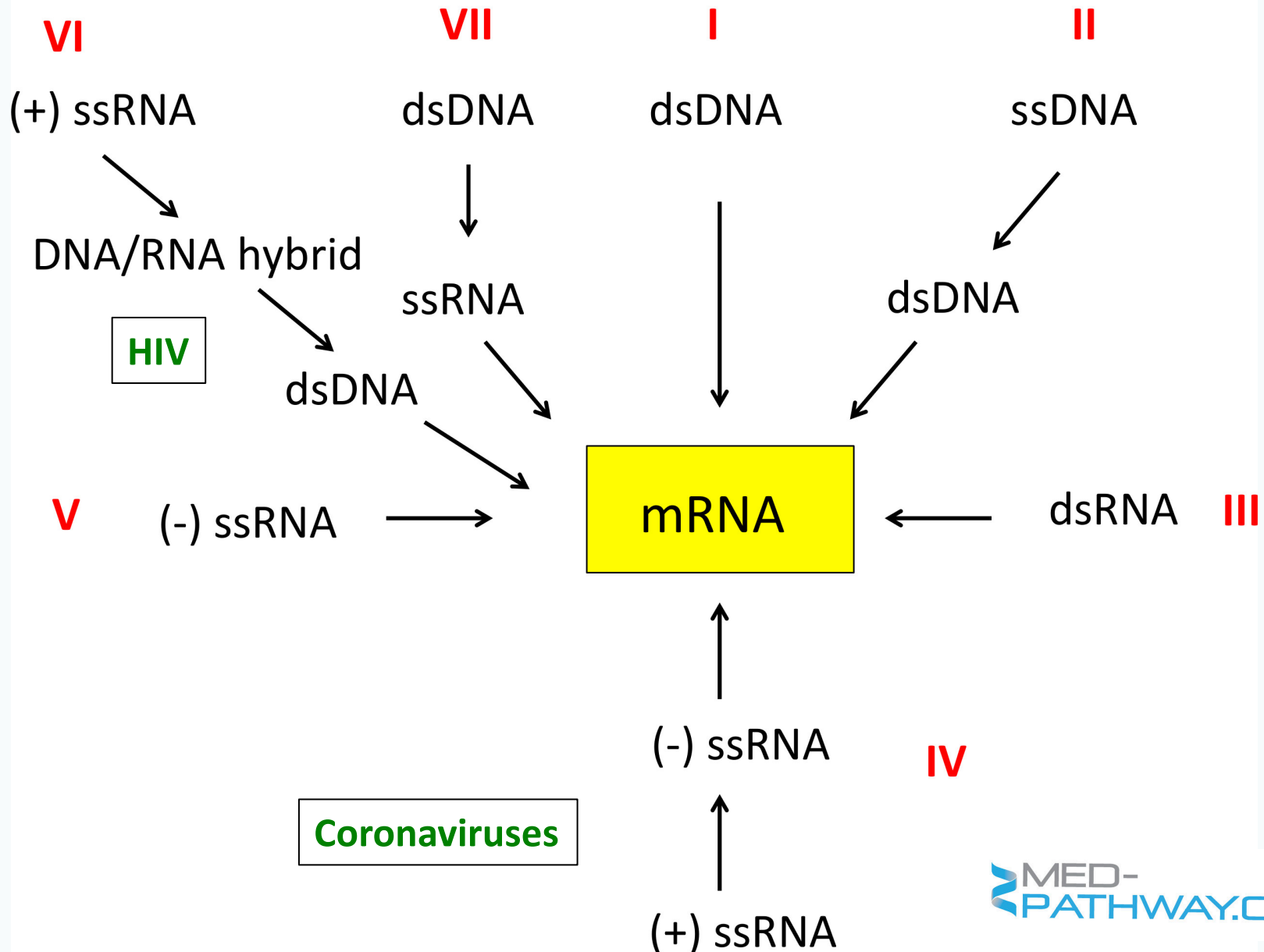
Jennifer A. Doudna

Born in the USA, 1964

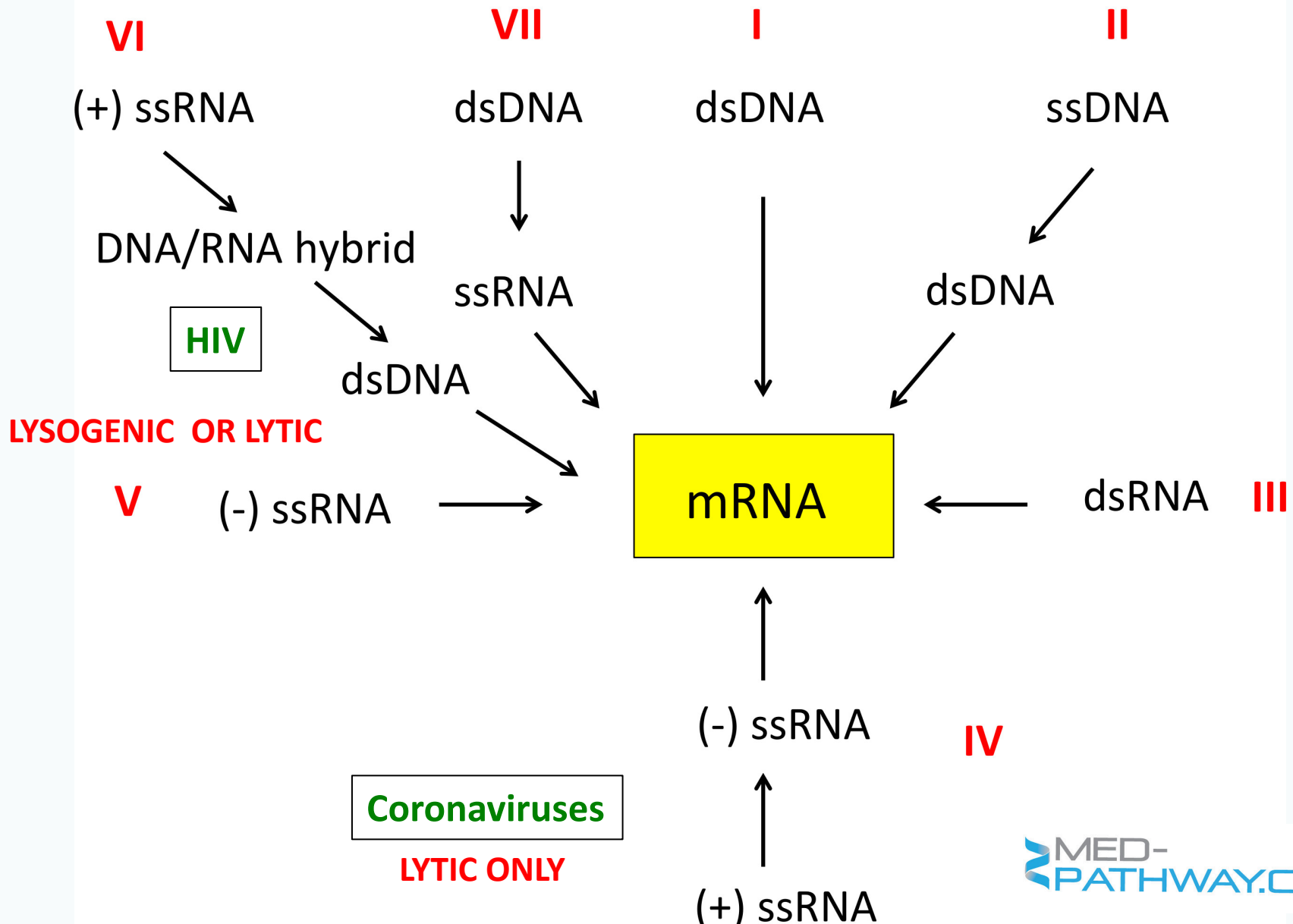
University of California, Berkeley, USA
Howard Hughes Medical Institute



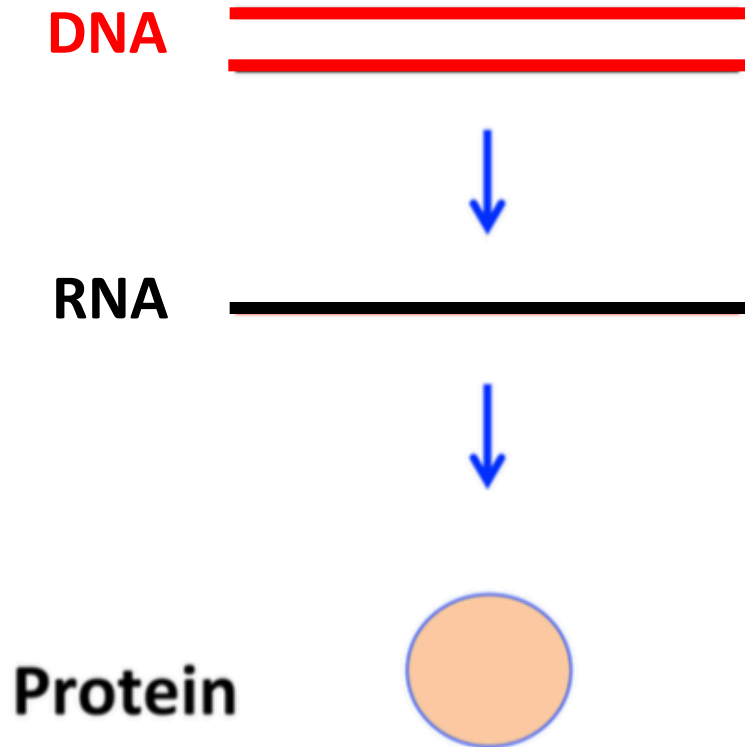
Baltimore Classification of Animal Viruses



Baltimore Classification of Animal Viruses



Crick's Central Dogma



Crick's Central Dogma

DNA



RNA



Protein



Retroviruses

RT = reverse transcriptase



RNA



RT



DNA: RNA



RT

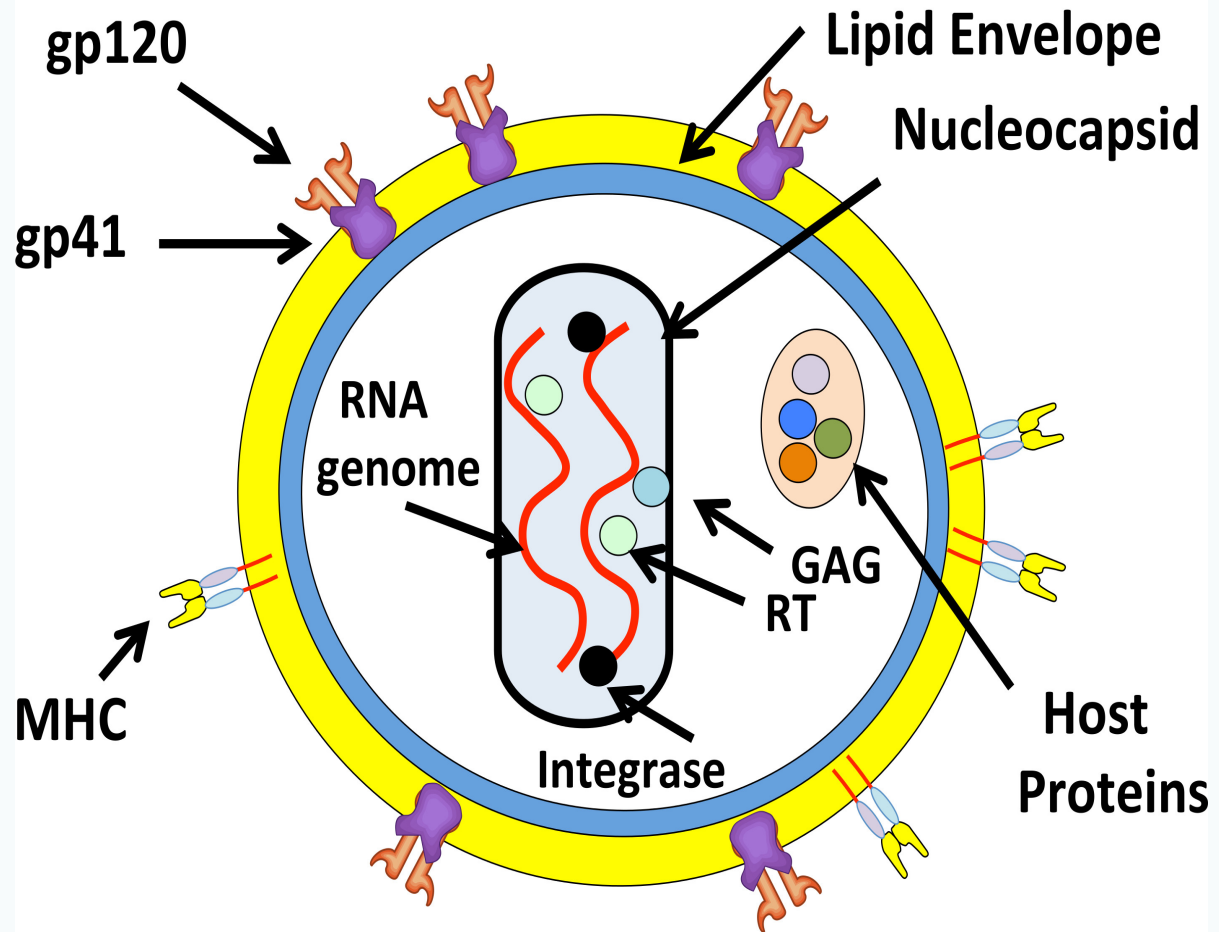
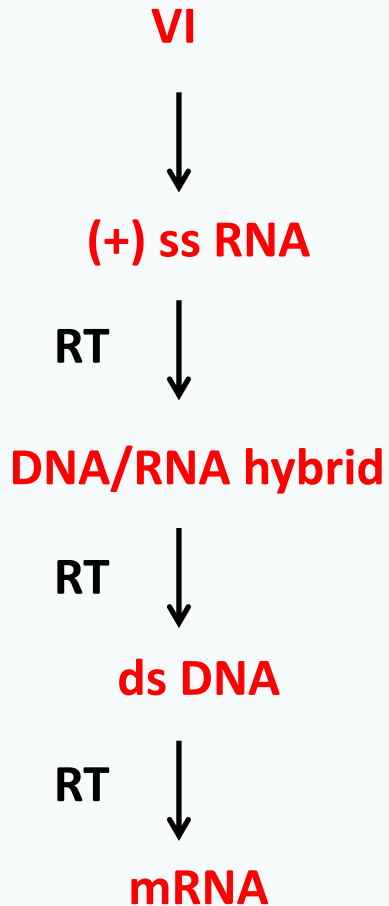


dsDNA



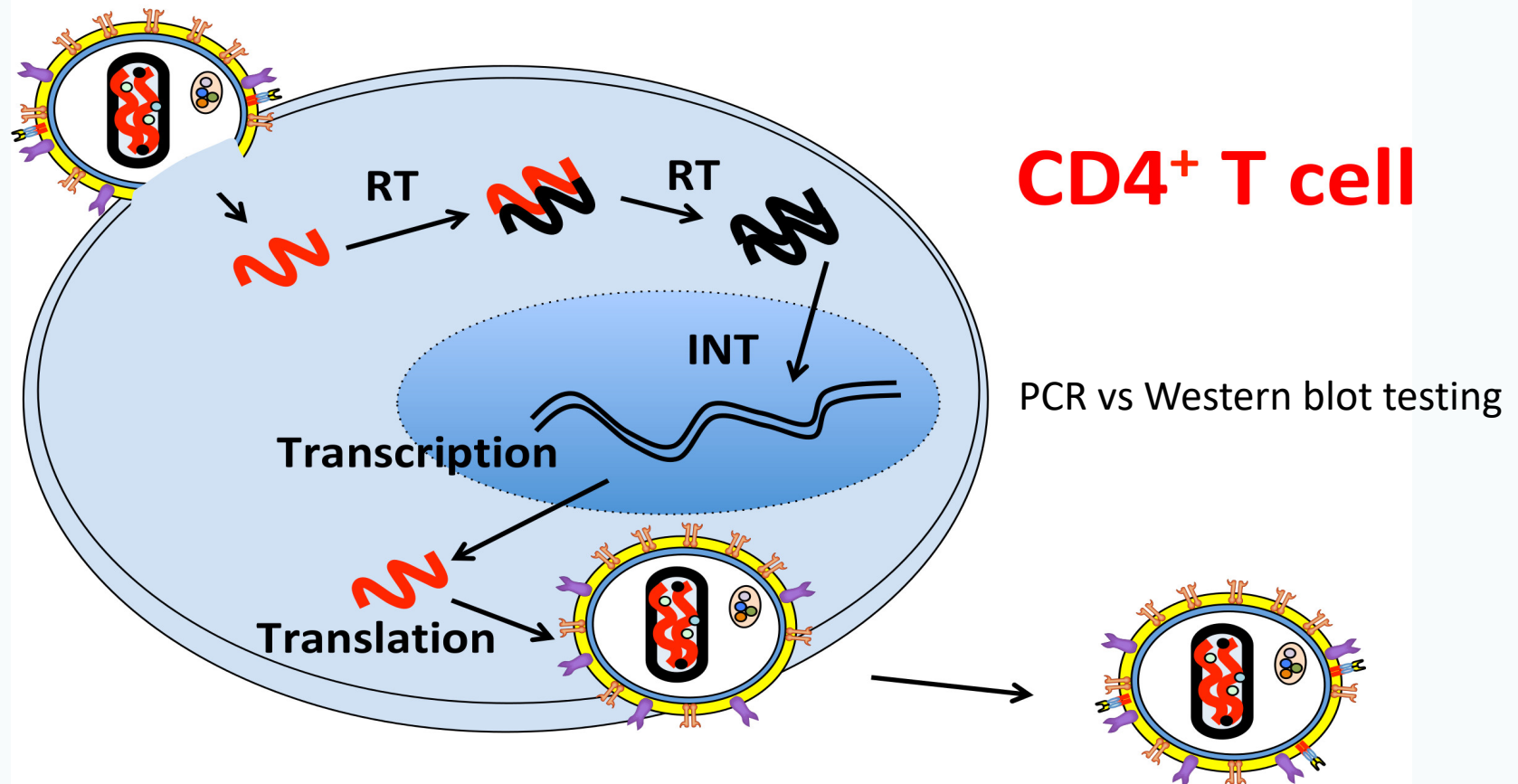
Intergration into
Genome

Retrovirus Structure

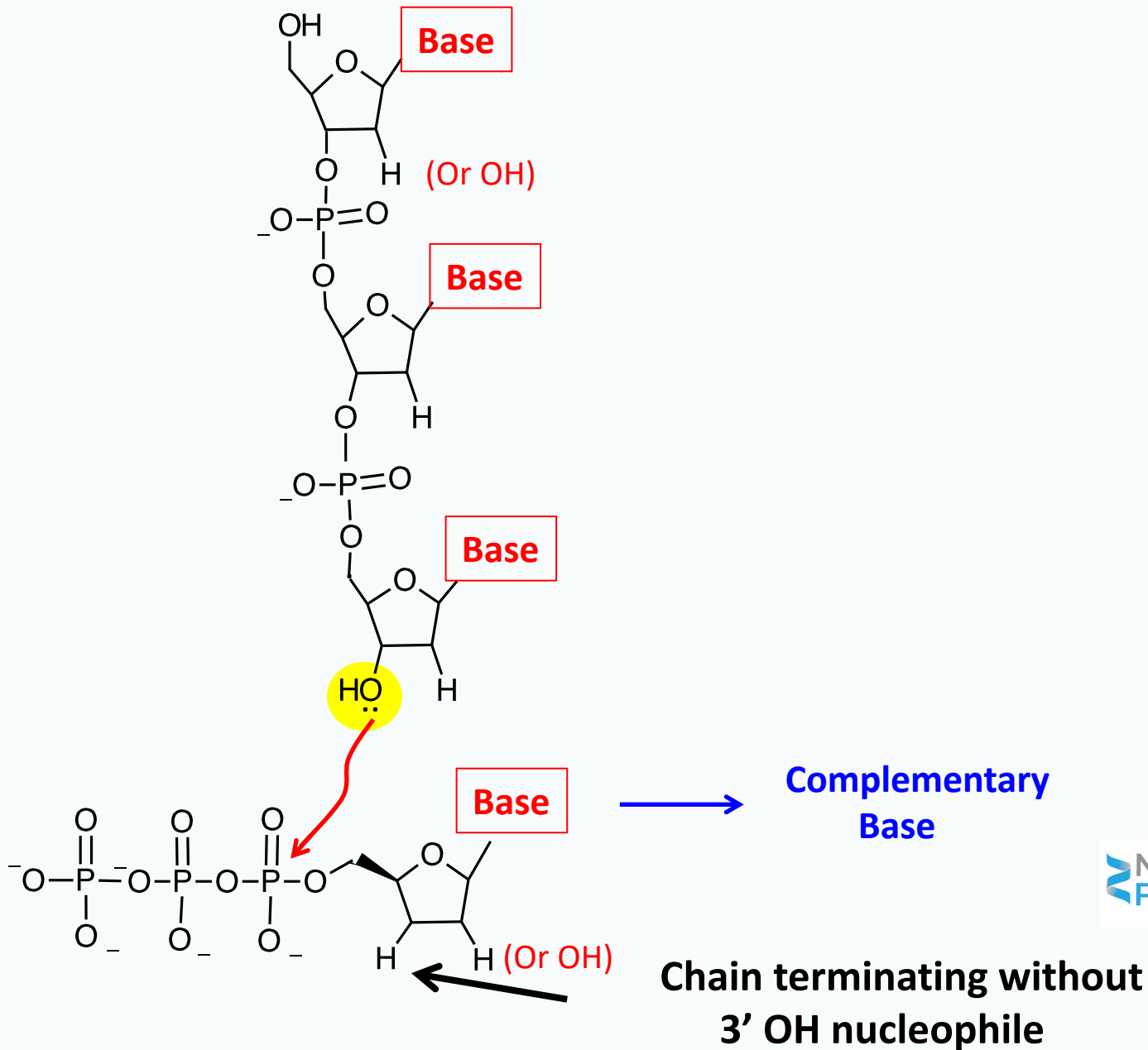


HIV & CD4 T Cells

HIV Infection

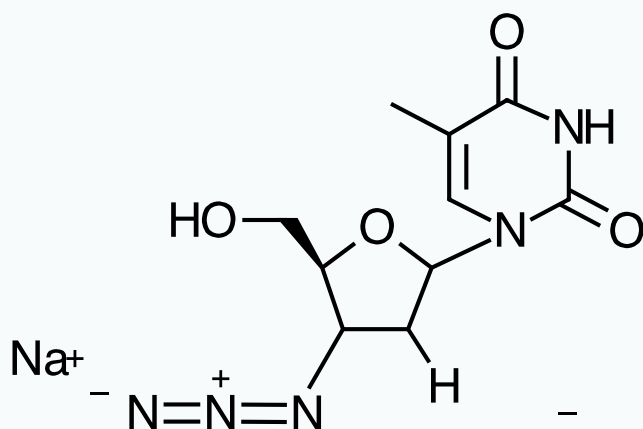


Antiviral Chain Terminators

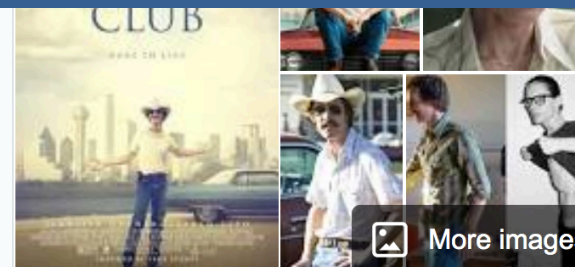


Azidothymidine (AZT)

AZT



Chain terminating without
3' OH nucleophile



Dallas Buyers Club

2013 · History/Drama · 2 hours

8/10

IMDb

93%

Rotten
Tomatoes

4.5/5

Amazon.co.uk

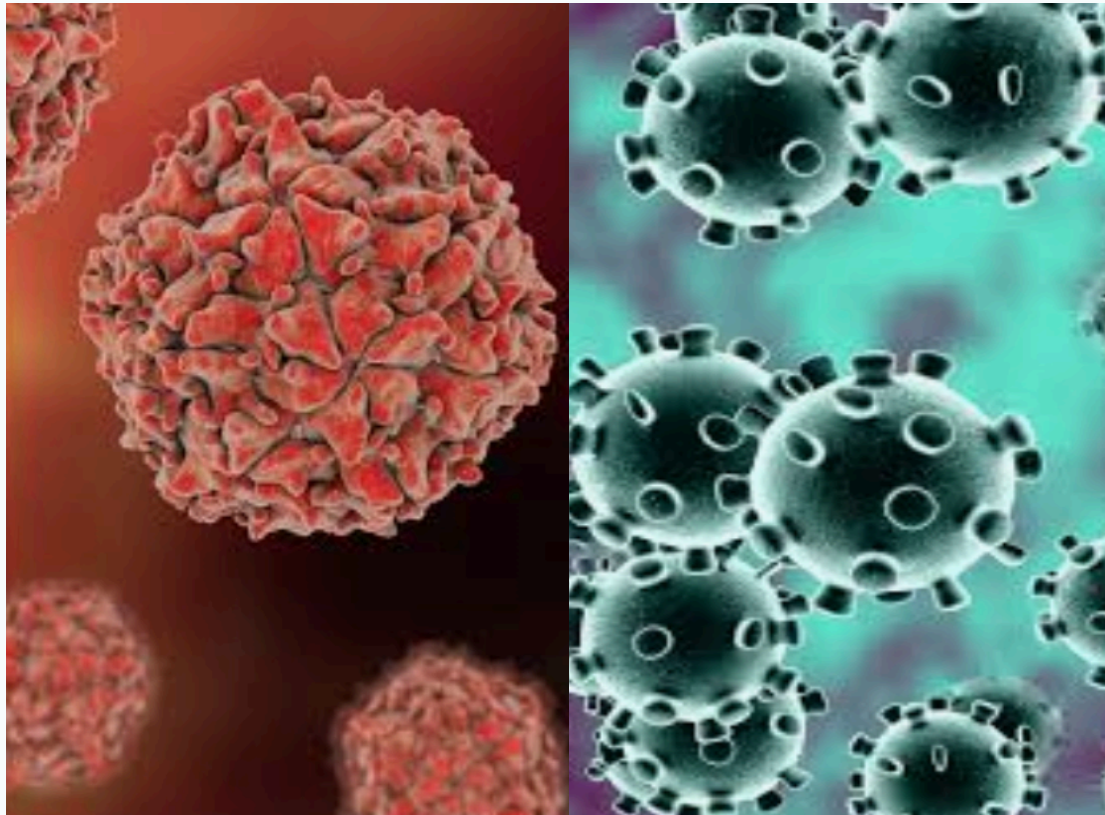
92% liked this film

Google users

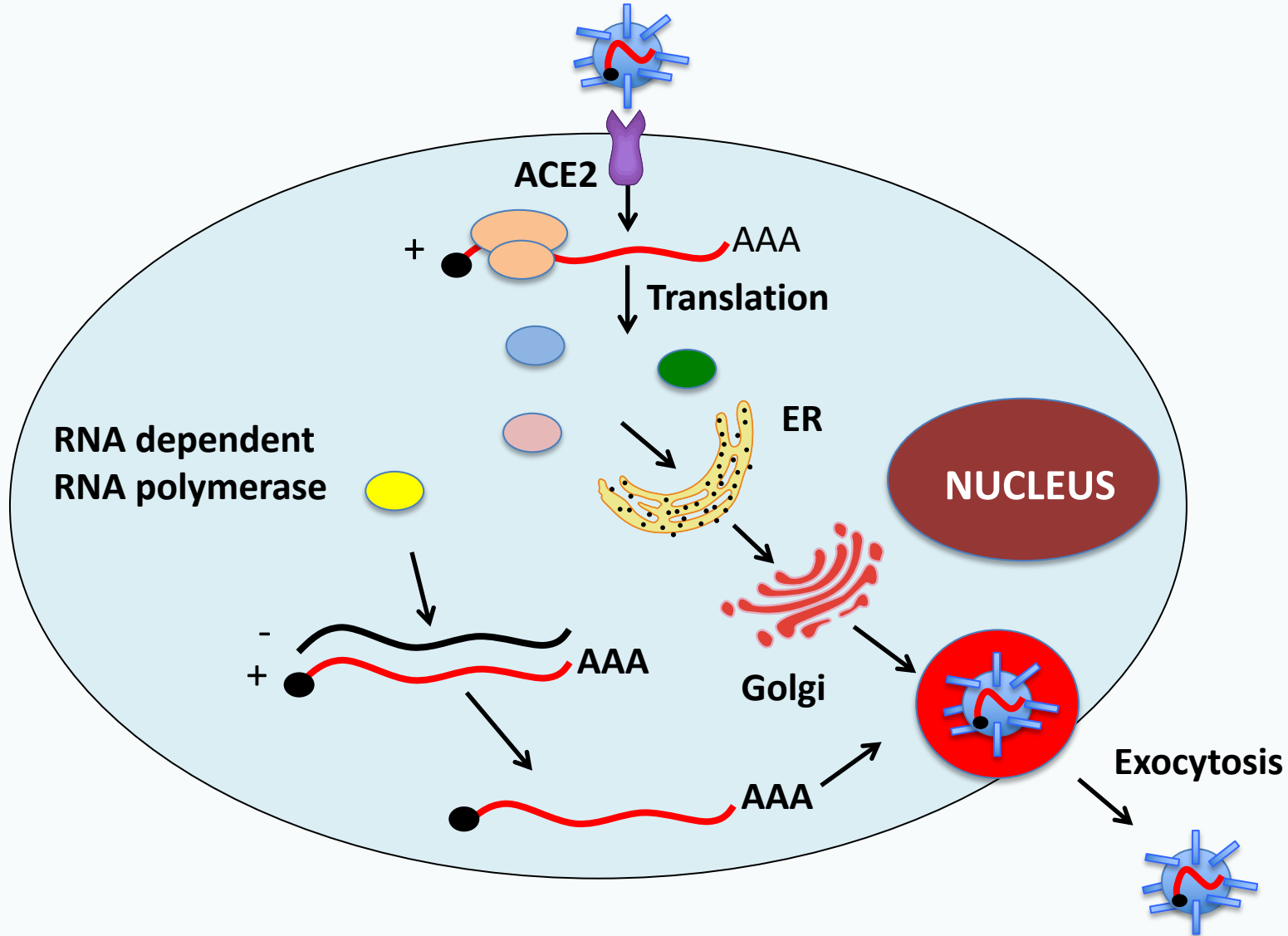


Ron, a rodeo cowboy diagnosed with AIDS, discovers a banned drug that can help patients survive longer. To get around the system, he forms a club to smuggle the medicine to those in need.

+ ss RNA Viruses

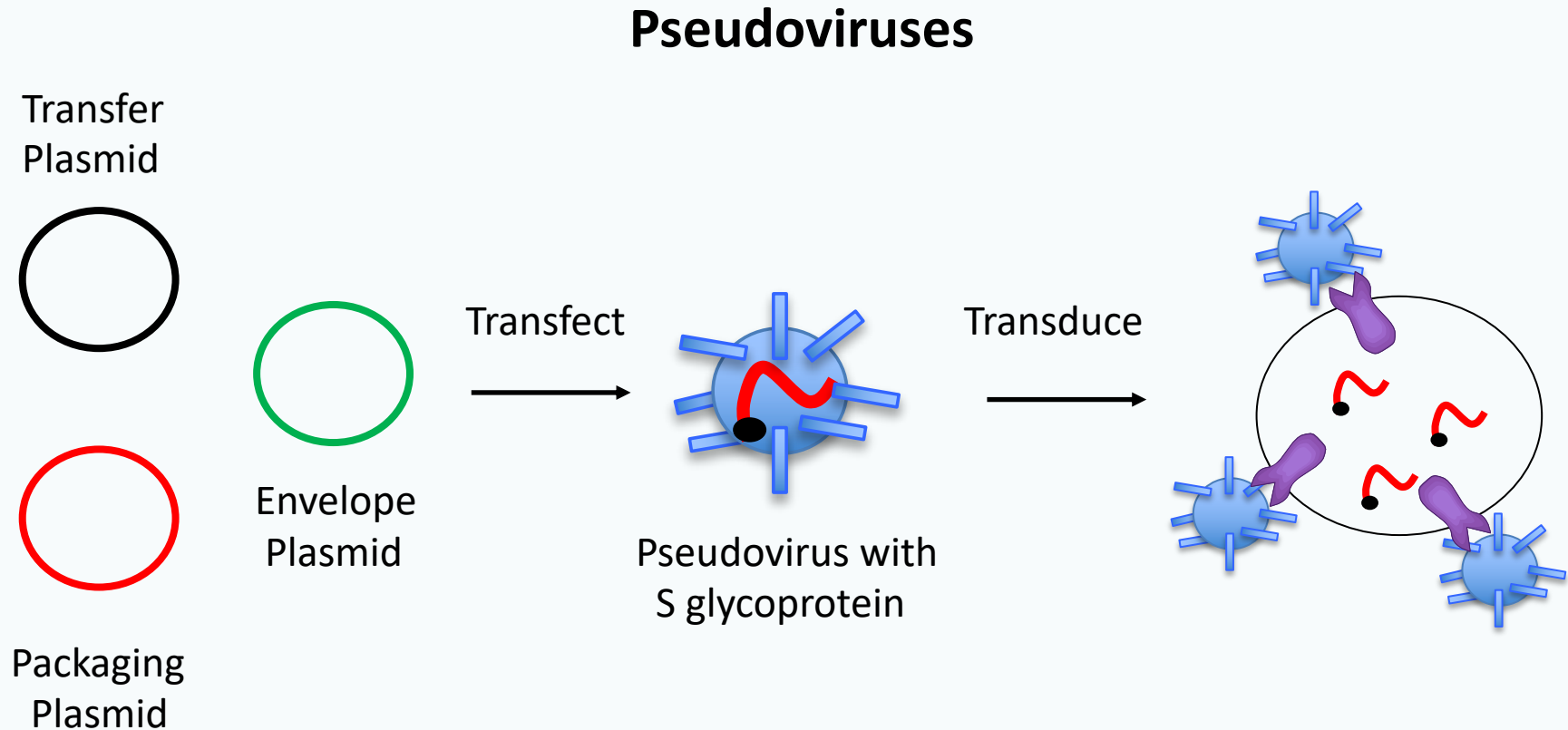


Coronavirus (SARS, MERS, SARS-coV-2)

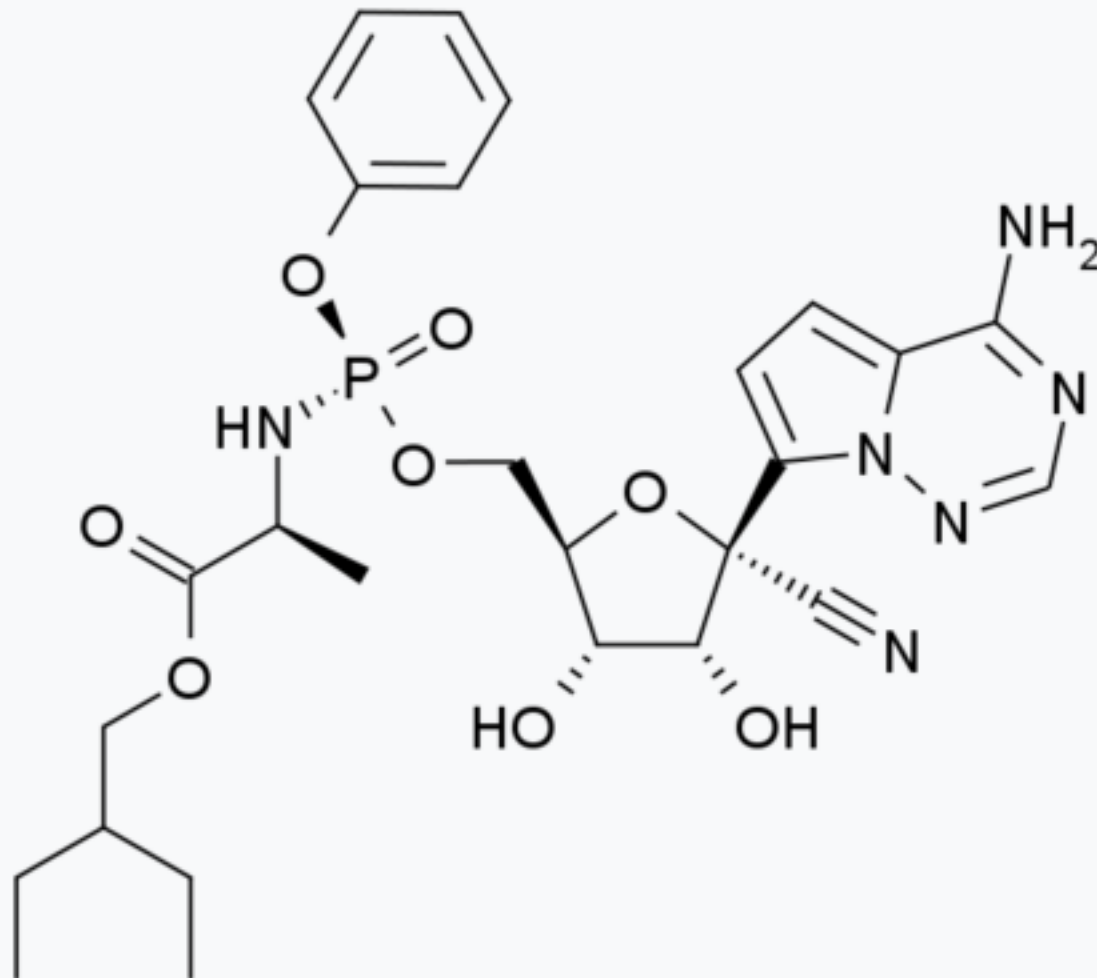


LYTIC vs LYSOGENIC

Studying Coronavirus Spike Protein

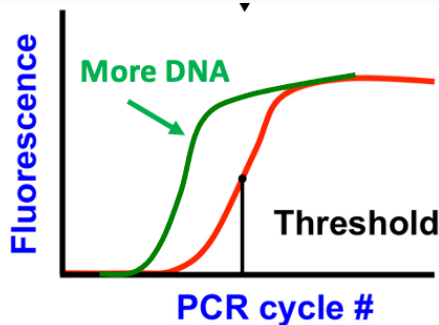
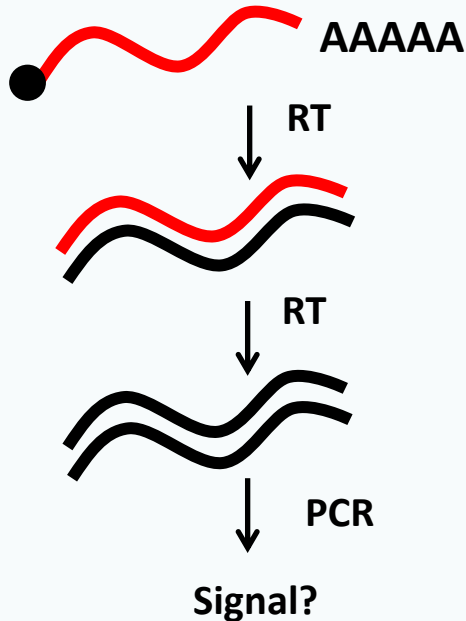


Remdesivir: Coronavirus anti-viral

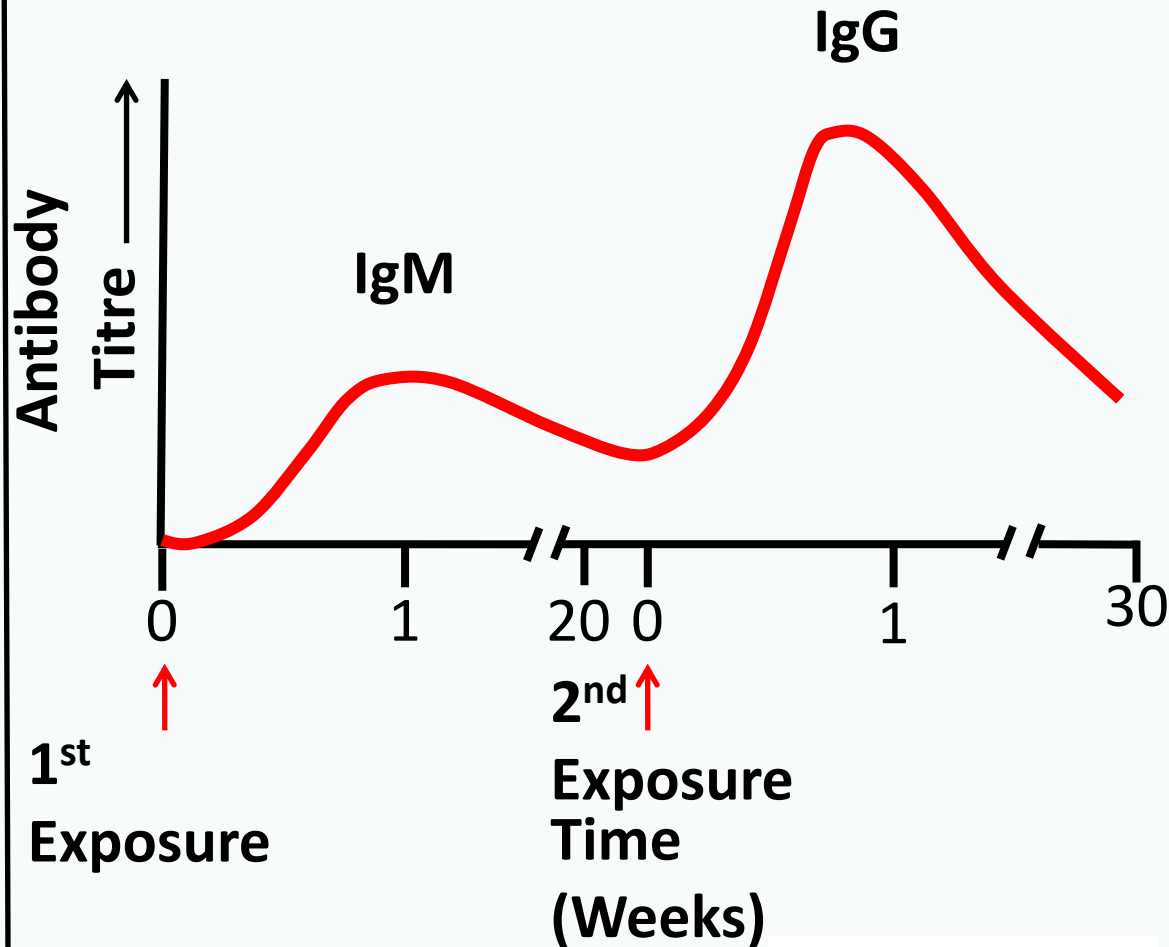


Coronavirus Testing: PCR vs. Antibodies

PCR (Active infections) Isolate Viral RNA




IgM/IgG (Evidence of Infection)



Workshop Passages

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First name *

Last name *

Your email address *

Your password *

Confirm your password *

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