

Section 2.1 - Viruses

SBI3U

MRS. FRANKLIN

What is a Virus?

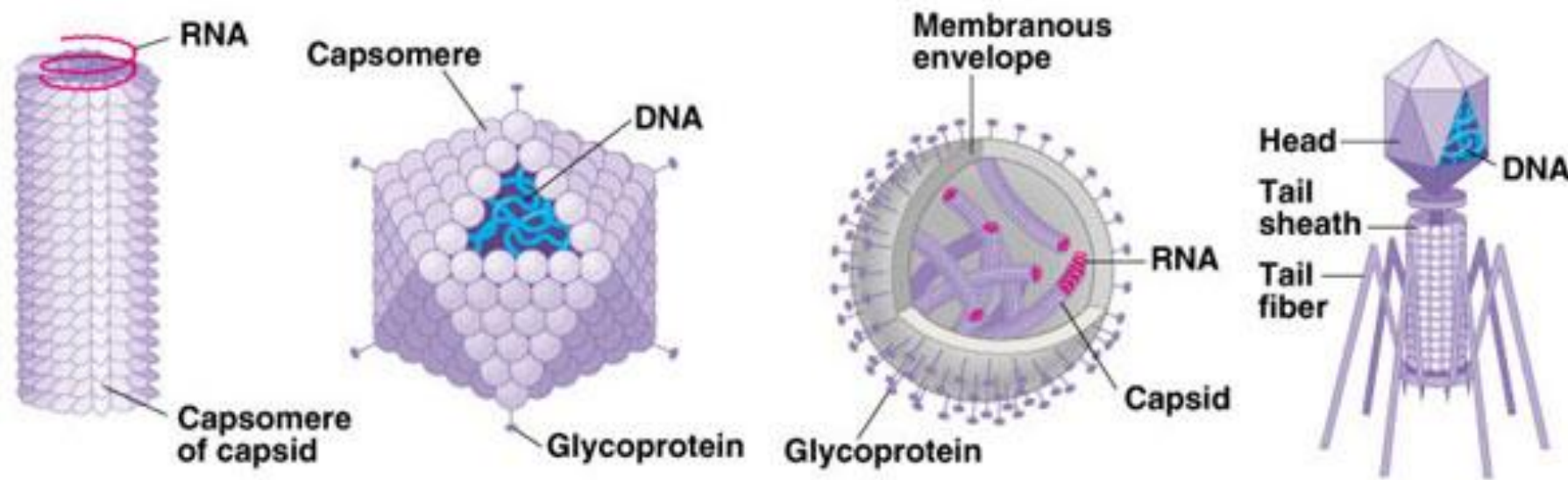
A *virus* is a structure that contains DNA or RNA that is not considered living for the following reasons:

- 1) Cannot live independently outside of the host cell
- 2) They are not a prokaryotic or eukaryotic cells and do not contain any organelles.

Classification of Viruses

Viruses are not living and thus are not classified using the Linnaeus Classification system. Normally scientists will use the *size and shape* to classify them.

Capsid:



Reproduction of Viruses

All viruses must undergo replication (copy the DNA) within the host cell. Viruses do not have their own proteins to be able to carry out this process on their own.

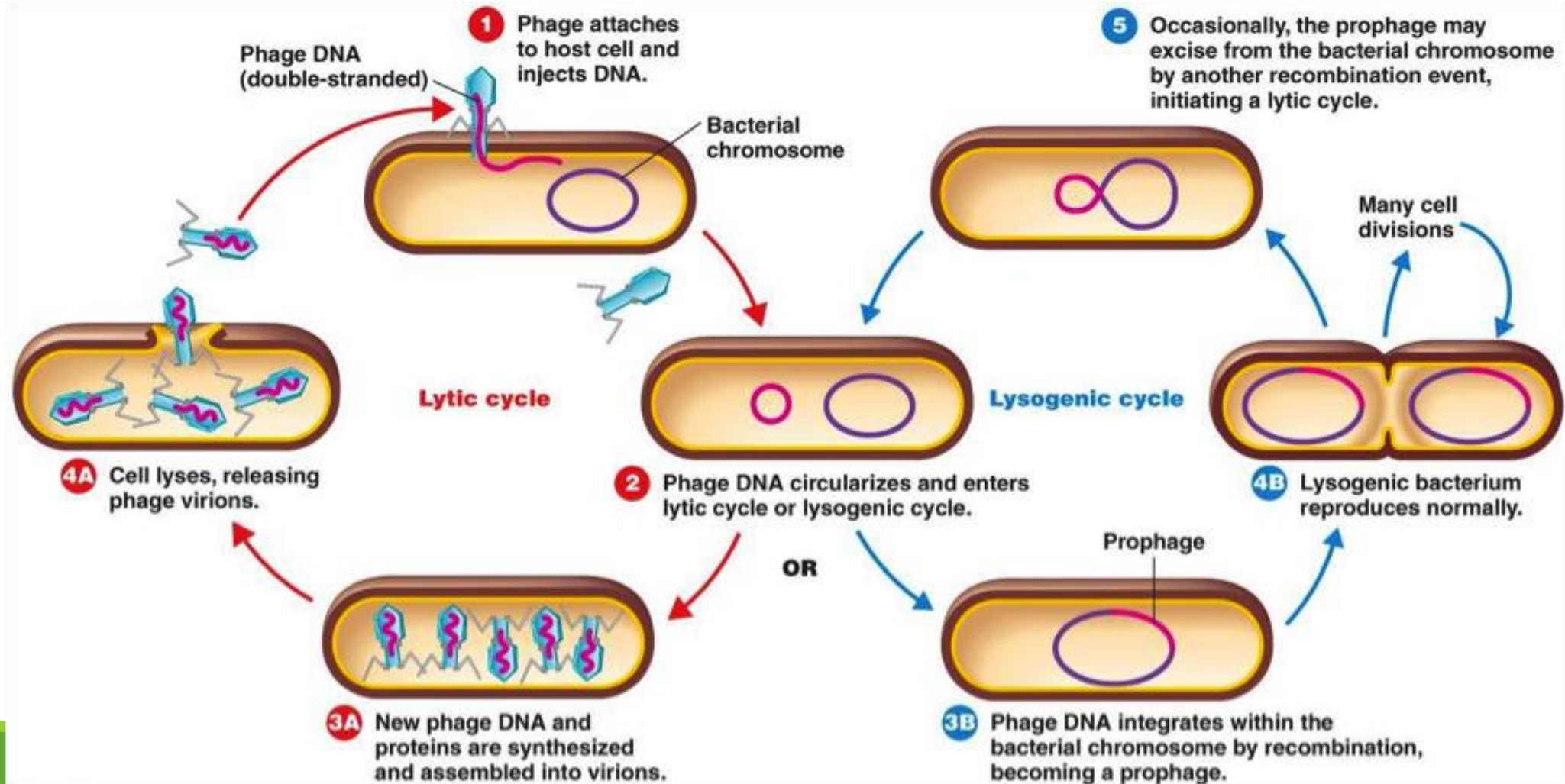
Once the DNA is copied and made into proteins, all of the individual components of the virus are assembled within the host cell.

The replication cycle can be one of the following:

1) Lysogenic:

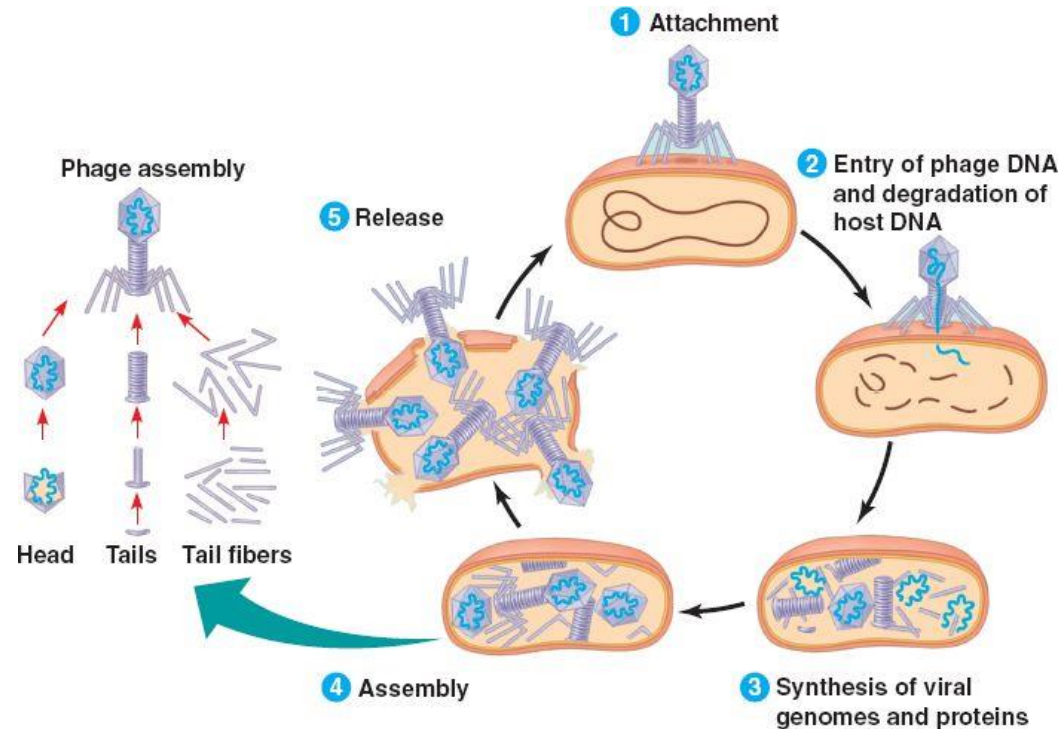
2) Lytic:

Reproduction of Viruses



Viruses and Disease

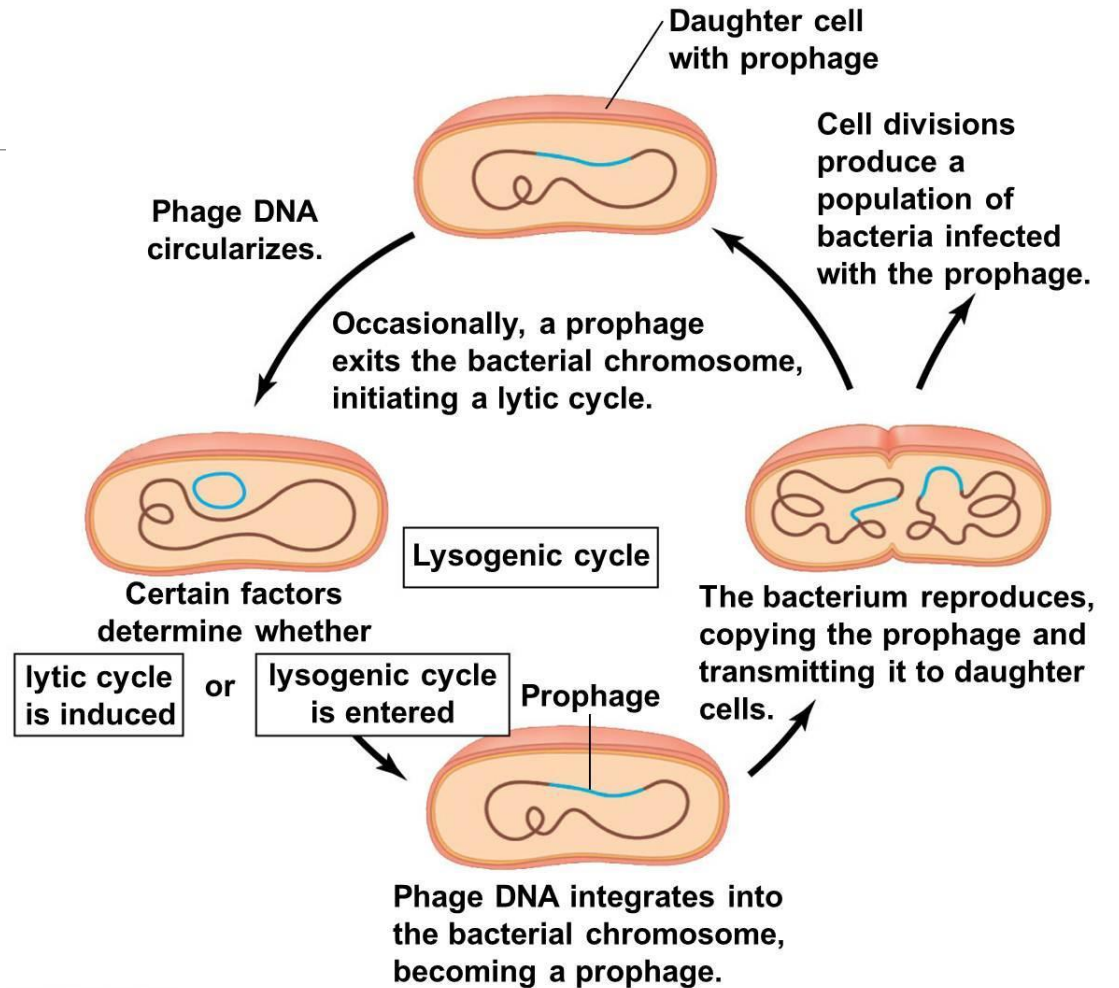
During the lytic cycle, when the new virus particles burst out of the cell, they immediately attach and infect other neighbouring cells. The amount of cells it infects depends on the type of virus that is infecting.



Viruses and Disease

Some viruses may be dormant within the cell and only go through a lysogenic cycle for a prolonged period of time.

The virus cannot be detected and no symptoms appear. The virus is able to spread into other cells through replication without actually killing the host cells.

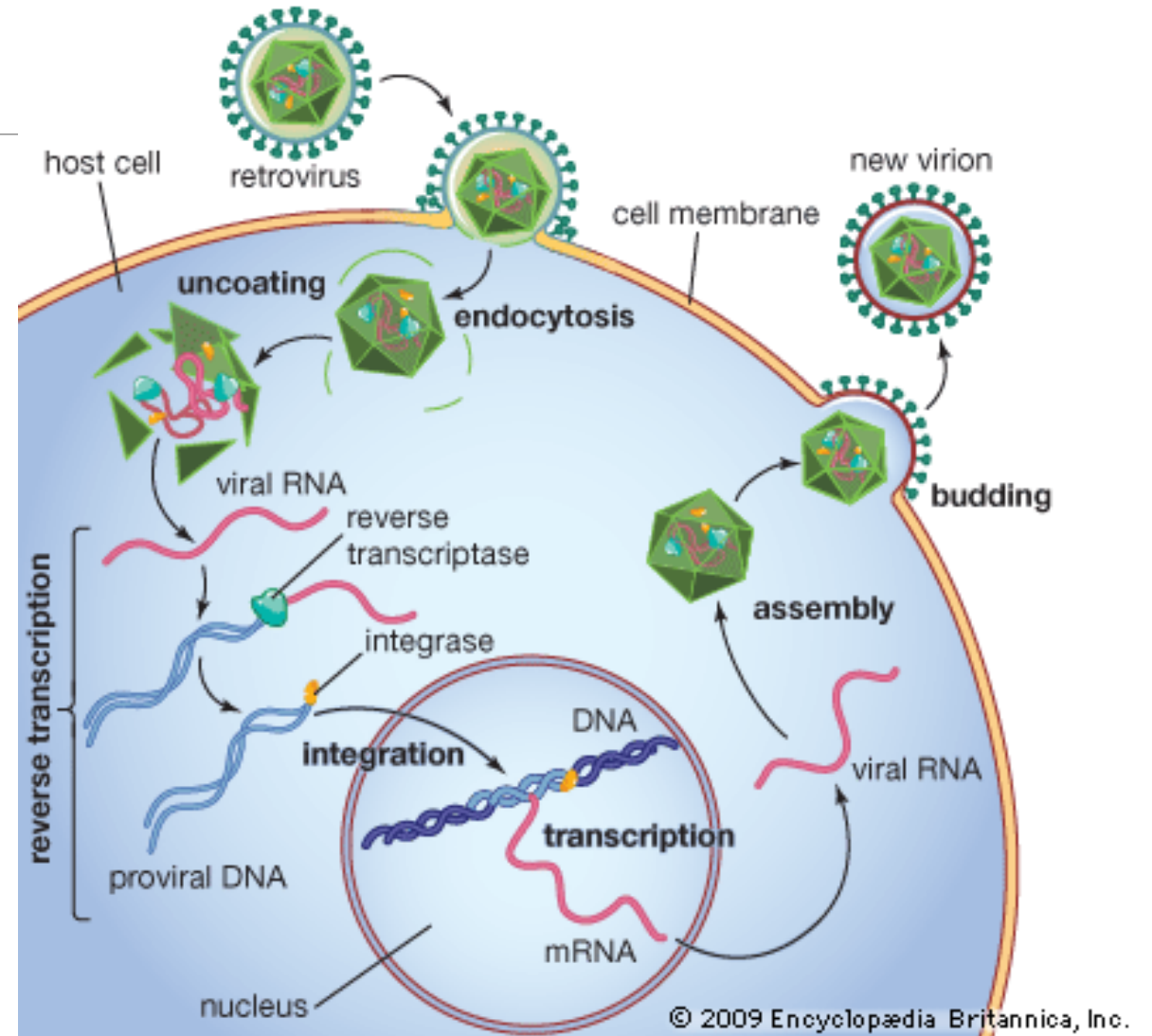


Patterns of the Disease

*Some viruses, such as herpes and HIV, will transfer their RNA into the host cell and transcribe it into a **proviral DNA**. This DNA strand will be integrated into the host's DNA.*

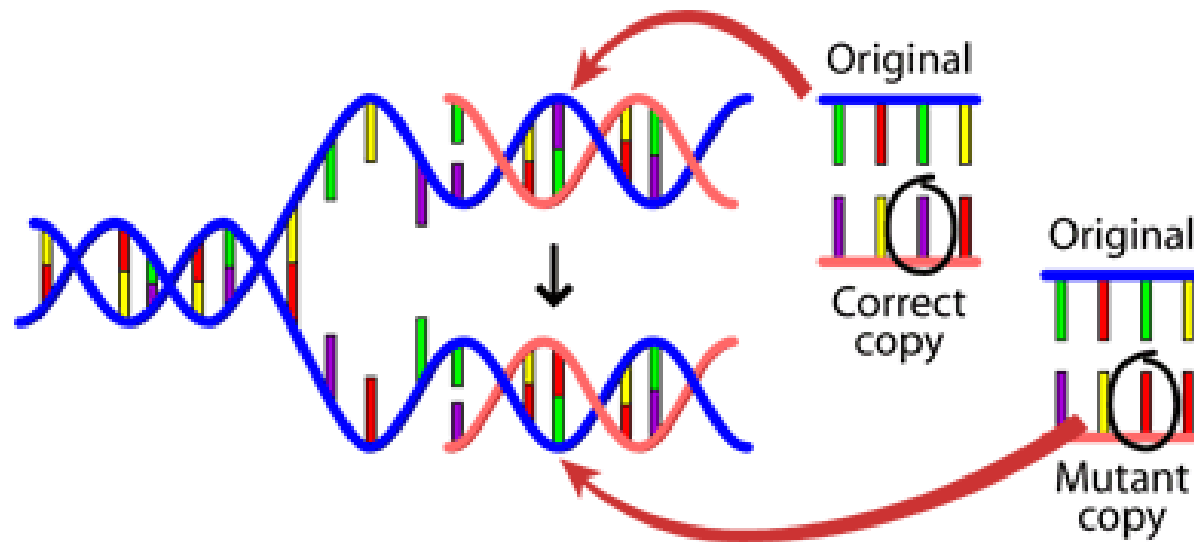
Every time the host cell divides and undergoes replication it also copies the proviral DNA.

Retrovirus infection and reverse transcription

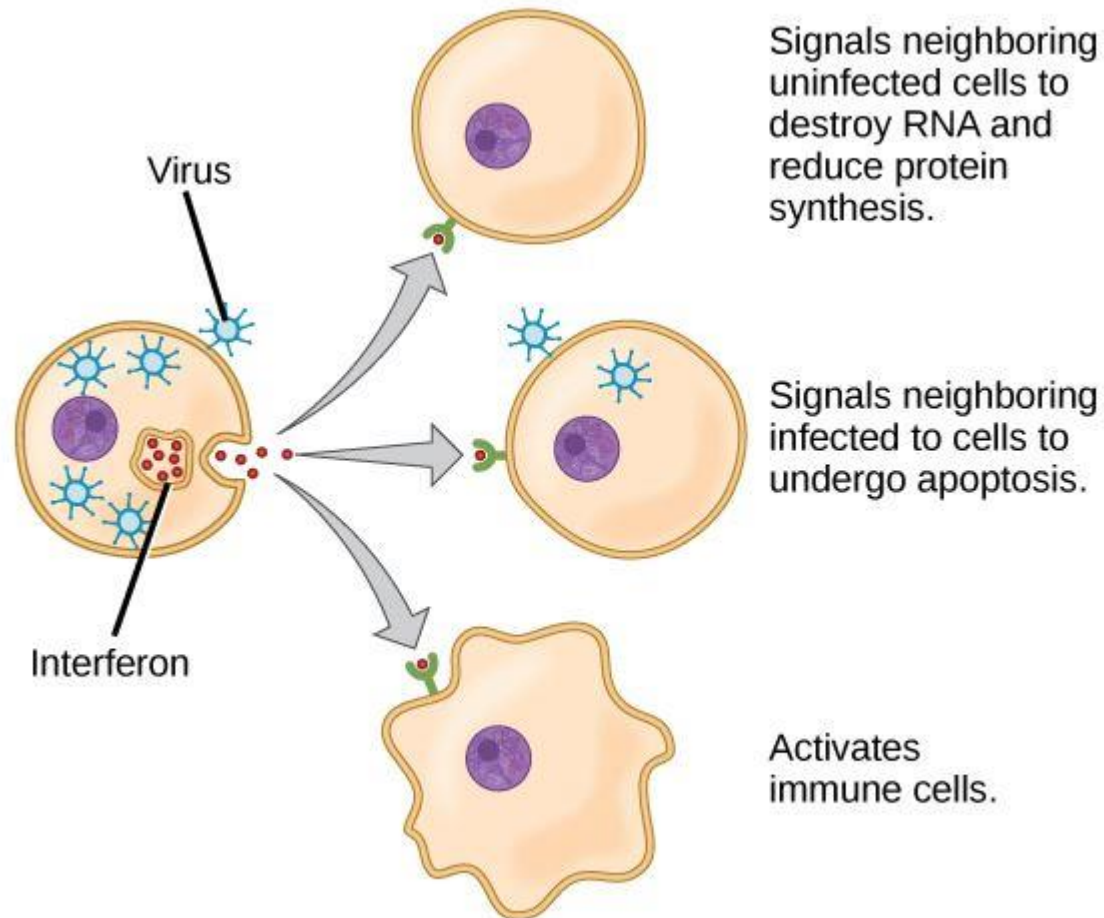


Viruses and Mutations

Viral DNA/RNA is able to mutate at a quick rate which in turn allows the virus to 'mask' itself and enter the host cell. The host's immune system will not recognize the new protein coat and in turn not attack the viral invasion.

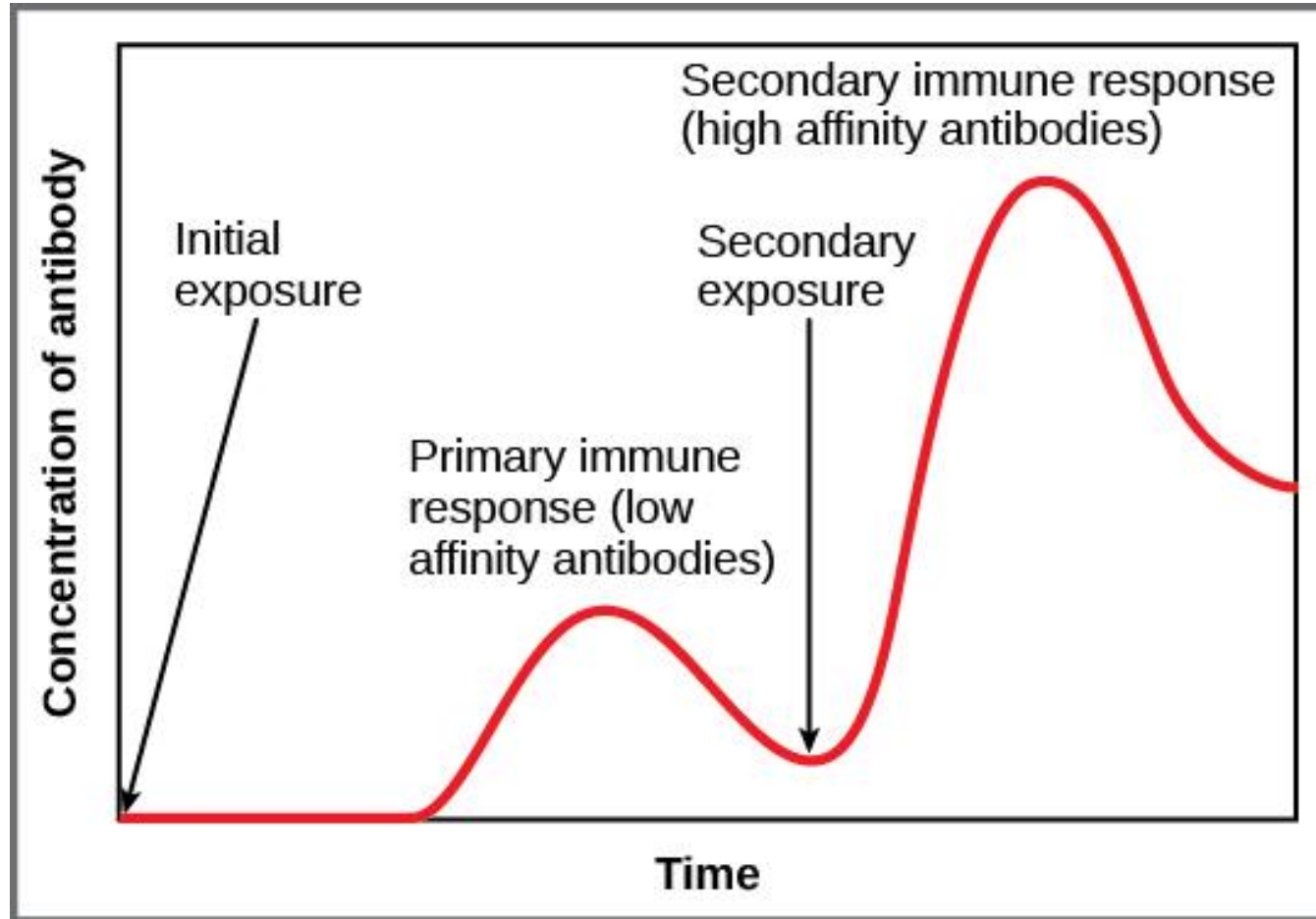


Immune System and Viral Infections



The infected cell will send various chemical signals to neighbouring cells to trigger an immune response.

Immune System and Viral Infections



Vaccinations

Vaccine:

Vaccines are thought to act as the initial exposure so that your immune cells could recognize and create an immune response (antibodies) against that particular virus.

This will strengthen your secondary immune response, so that when exposed, the virus can be destroyed immediately.



Homework

- Complete pg. 58 # 5, 6, 9, 11 & 14

- Read the article on the Ebola Virus