

VIRUSES

1. Describe the structure of a virus by completing the following chart.

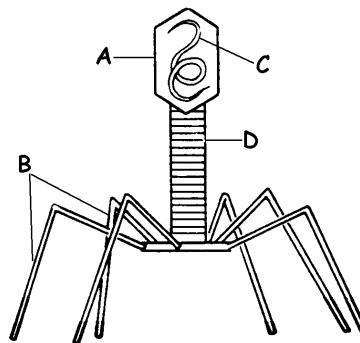
Viral Part	Description of Part

2. Some viruses have an envelope that surrounds the capsid. Complete the following chart providing information regarding viral envelopes.

Description	Function	Origin

3. Match the structure listed below with the correct letter from the diagram.

- _____ capsid
- _____ genome
- _____ tailpiece
- _____ tail fibers



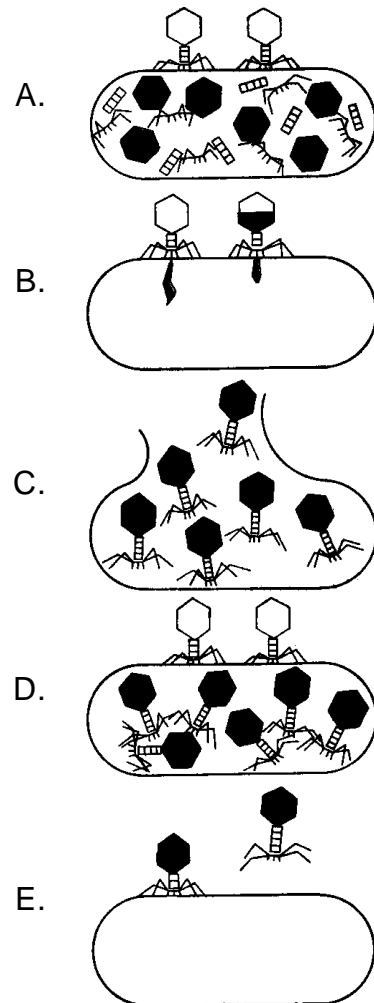
4. Most viruses are obligate intracellular parasites. Describe what this means.

5. Listed below are the steps in the lytic replication cycle of viruses. Put the steps in the correct order.

- _____ Phage genome directs host cell to produce phage components (DNA & capsids)
- _____ Self assembly of phage
- _____ Bacteriophage attaches to host cell
- _____ Host cell lyses releasing phage particles
- _____ Hydrolytic enzymes destroy host cell's DNA
- _____ Phage contracts and injects DNA into host cell

6. Shown below are diagrams representing the stages in viral reproduction. Match the diagram with the correct description.

- _____ Self assembly of viral parts
- _____ Viral genome directs host cell to produce new viral parts
- _____ Virus contacts injecting genome into host cell; hydrolytic enzymes destroy host genome
- _____ Virus attaches to host cell
- _____ Cell lysis; new viruses released

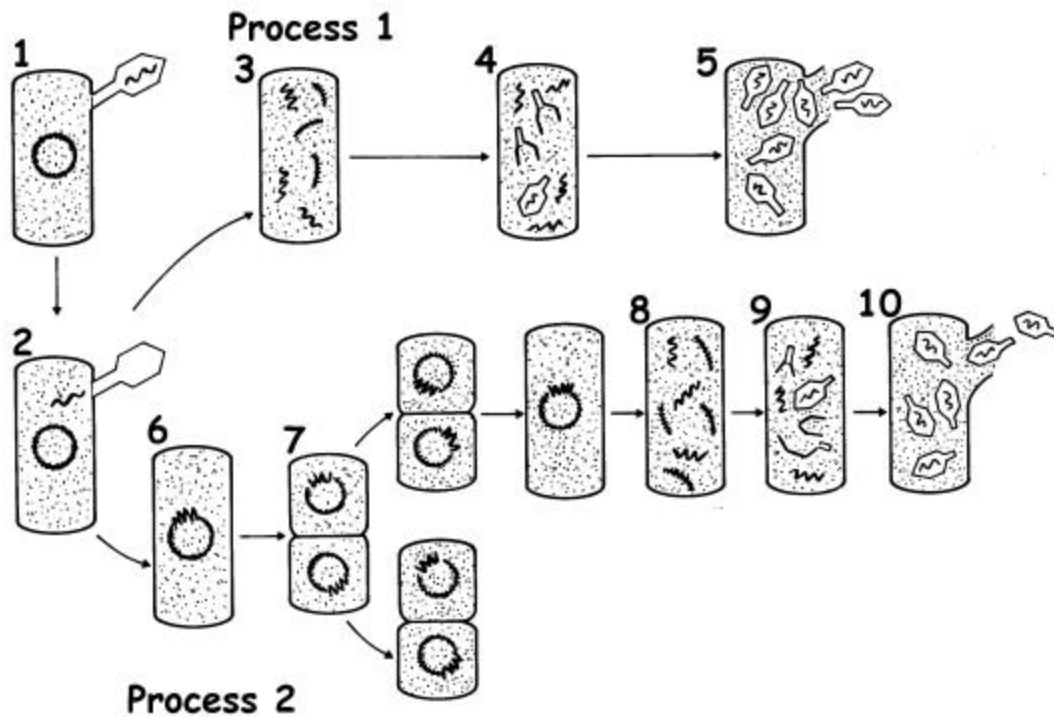


7. How do bacteria protect themselves against viral infection?

8. How are the lytic and the lysogenic cycles different?

9. What is a prophage?

10. Examine the diagram below.



a. Which process represents lytic reproduction? _____

b. Which process represents lysogenic reproduction? _____

c. Match the description with the correct number from the diagram:

_____ Incorporation of viral genome into host cell genome

_____ Replication of lysogenic cell

_____ Attachment of the virus

_____ Insertion of the viral genome into host cell

_____ Self-assembly of viral parts

_____ Cell lysis; release of new viruses

_____ Replication of viral genome and capsid

11. Define:

Lysogenic Cell	
Lysogenic Conversion	

12. List three diseases that are caused by bacteria that have undergone lysogenic conversion.

What causes the pathogenicity of these diseases? _____

13. How is the replication of the herpes virus different from that of other viruses?

14. Define provirus. _____

15. Listed below are the steps in the replication of viruses with envelopes. Match the description with the correct step.

- | | |
|--|----------------------------------|
| _____ Glycoprotein spikes attached to receptor sites on host cell membrane | A. Assembly & Release |
| _____ Envelope fuses with host cell membrane; entire virus enters cytoplasm of host cell | B. Attachment |
| _____ New capsids surround viral genomes; new viruses bud off cell surface; virus surrounded with modified cell membrane | C. Entry |
| _____ Cellular enzymes remove protein capsid from around viral DNA | D. Viral RNA & Protein Synthesis |
| _____ Viral RNA polymerase replicates viral RNA; viral mRNA transcribed and translated | E. Uncoating |

16. How is the replication of retroviruses different from that of other viruses?

17. What is the function of reverse transcriptase? _____

18. What effect could the expression of proviral genes have on the host cell?

19. Listed below are the steps in the replication of a retrovirus. Put the steps in the correct order.

_____ Attachment of virus

_____ Reverse transcription -- Viral RNA used as template to produce minus strand of DNA

_____ Uncoating of single-stranded RNA genome

_____ Proviral DNA transcribed into mRNA; mRNA translated into proteins and may become genome for next generation of viruses.

_____ Capsid proteins enzymatically removed

_____ Virus enters host cell cytoplasm

_____ Integration -- newly produced viral DNA enters nucleus, inserts into host DNA, & becomes provirus

20. List the ways viruses can cause disease symptoms.

21. What medical weapons are used to fight viral infections?

22. Some viruses have been implicated in human cancers. Complete the following chart.

VIRAL GROUP	EXAMPLE/DISEASE	CANCER TYPE
Retrovirus	HTLV / Adult leukemia	
Herpes virus	Epstein-Barr/ Infectious mononucleosis	
Papovavirus	Papilloma/ Human warts	
Hepatitis B virus	Chronic hepatitis	

23. Define oncogene. _____
