

VIRAL LYSIS AND BUDDING

INTRODUCTION

Viruses come in all shapes and sizes and have different life cycles. In this activity, you will explore one aspect of the virus life cycle: how viruses are released from infected cells. But first, let's review some basic facts about viruses.

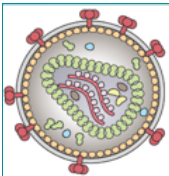
1. List three to five distinguishing characteristics of viruses.
2. List three to five distinguishing characteristics of living organisms.
3. Provide evidence from your answers above to support a claim that
 - a. viruses are living organisms.
 - b. viruses are not living organisms.

PROCEDURE

Virus Explorer Interactive

Explore the interactive "Virus Explorer" at <https://www.hhmi.org/biointeractive/virus-explorer> to familiarize yourself with the characteristics of viruses. Then answer the questions below.

4. List three characteristics used to classify different types of viruses.
5. What is a viral envelope? Where does it come from?



Demonstration *Viral Lysis and Budding*

6. Select one enveloped and one nonenveloped (naked) virus and then complete the chart below.

Virus name	Shape	Enveloped (Yes or No)	Genome (DNA or RNA)	Which organism(s) does it infect?	Does it cause disease?

First Demonstration

Your teacher will now demonstrate how enveloped viruses, such as HIV, are released from host cells.

7. a. In this demonstration, what represents the virus particles?

b. What represents the host cell?

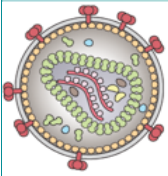
8. When a new virus particle is released from the cell, what does it have surrounding it? Be specific.

9. a. A human blood cell, which is the type of cell infected by HIV, is about 10 micrometers (μm) in size. HIV is about 120 nanometers (nm) in size, or 0.12 μm . About how many times smaller is the virus compared to the blood cell?

b. Is the demonstration an accurate representation of the relative size of the virus versus host cell? Explain your answer.

HIV Life Cycle Animation

Watch the animation of the HIV life cycle at <https://www.hhmi.org/biointeractive/hiv-life-cycle>. If you have seen this animation before, just review the segment from about time 2:52 to the end of the video. It focuses on how HIV is released from an infected cell.



Demonstration
Viral Lysis and Budding

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Student Handout

10. Identify one important difference between how the virus was shown to exit the cell in the demonstration and how the virus is actually released from the infected cell based on the animation.

Second Demonstration

Your teacher will now demonstrate the release of a nonenveloped virus from an infected cell.

11. a. In this demonstration, what represents the virus particles?

b. What represents the host cell?

12. What happens to the cell when a nonenveloped virus is released?

13. In summary, what are the two strategies that viruses use to exit infected cells? Write a sentence to describe each one.