



High School Science Virtual Learning

Applied Biological Science

The HIV Pandemic

April 30, 2020



High School Applied Biological Science

Lesson: April 30, 2020

Objective/Learning Target:

Recognize that HIV is a virus that attacks the immune system and determine how it became a pandemic.

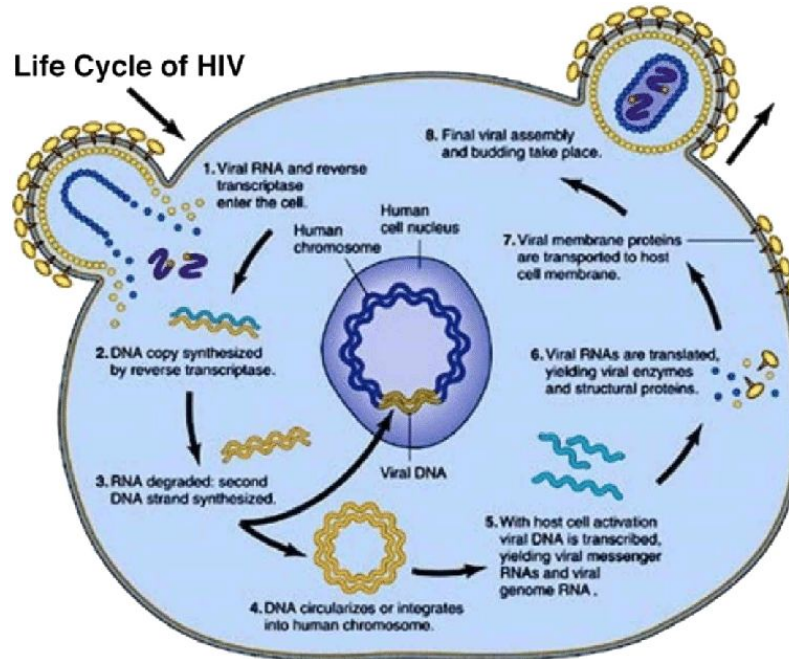


Let's Get Started:

1. Watch this introduction [video](#) to learn about what is HIV and how it is spread.
2. Why is HIV considered such a serious disease?

Let's Get Started: **Answer**

HIV attacks the immune system and can go undetected for years; there is currently no cure for HIV but there are treatments to help manage the disease





Lesson Activity:

Listen to the Radiolab podcast on patient zero by listening to "[The Cell that Started a Pandemic](#)" and answer the following questions:

1. Who was the first person with HIV (Patient 0), as most people understand the story? Who is really believed to be the first human to have contracted HIV? In what year did he/she live?
2. How did researchers determine who the real "Patient 0" was? Scientists revealed where human HIV originated by looking at genetic diversity between different HIV samples. Explain how this works.
3. Describe where geographically HIV originated and how researchers hypothesize the virus moved out into the world to become a pandemic.
4. What is "spillover"? When and how did HIV spillover, and from what type of animal? Describe the spillover incident. In what area of the world did this occur?
5. How did "Chimp 0" get the simian version of HIV (SIV)? How did scientists determine this?



Lesson Activity: Answers

1. Gaetan Dugas; most likely hunter in 1908
2. Scientists revealed where human HIV originated by looking at genetic diversity between different HIV sample by using a molecular clock that uses mutation rates in strains.
3. Sub-saharan Africa was being heavily colonized with mass city migrations; spread down the Sanga river and spread through sexual contact; 1920 was tipping point
4. Moment when a virus in one species passes into another; 1908 from a chimpanzee; most likely from an open wound from a hunter, southeastern Cameroon
5. The chimp ate a red-capped mangabey with SIV virus, then ate spot-nosed guenon with SIV virus; one cell gets exposed to both viruses and polymerase enzyme in cell creates hybrid virus that evades immune system; out of 12 spillovers, only 1 has caused global pandemic



Practice Questions

For each statement, indicate whether it is true or false. If false, explain why it is false.

1. Gaetan Dugas was the first person to contract HIV in the 1980s.
2. HIV can be transmitted by sneezing or sharing a drink.
3. HIV is a communicable (contagious) disease that attacks the immune system.
4. HIV originated in west Africa most likely when a hunter cut himself while hunting a chimpanzee infected with SIV.
5. HIV has an extremely high mutation rate for a virus and is therefore difficult to cure.



Practice Questions - Answers

For each statement, indicate whether it is true or false. If false, explain why it is false.

1. False; the first person to contract HIV happened in 1908
2. False; the virus is transmitted through blood or sexual fluids
3. True
4. True
5. True



Additional Practice

1. Check your understanding by taking this [online quiz](#) of HIV/AIDS.
2. Test your knowledge by completing this [HIV case study](#).
3. Learn more about the “London patient” who was the most recent HIV positive person to be cured [here](#).
4. Learn more about how Covid-19 may also be attacking the immune system similar to HIV [here](#).