

Deadly Letters: The Anthrax Mystery

Investigators need your help to solve another anthrax mystery. The fictional case file reads:

Bacillus anthracis has been found in a letter at the local post office. The bacteria can cause anthrax, a very rare but deadly disease. Fortunately, no one has contracted the illness. However, finding the source of the bacteria is crucial to prosecuting the criminal who sent the letter. Initial investigations have narrowed down the search to just a few labs that study *Bacillus anthracis*.

To do your detective work, obtain a DNA “sample” from one of the suspected labs and determine its sequence. Then compare all the sequences found in your class and try to identify the “guilty” lab.

Procedure

- 1 As a class, you watched an animation titled The Sanger Method of DNA Sequencing (hhmi.org/biointeractive/dna/animations.html). Watch it again (if necessary) and, in the space below, draw a series of cartoon panels that show the main steps involved in DNA sequencing. (Use the back of the handout, if necessary.)
- 2 Open your envelope containing an anthrax DNA sample from a suspected lab. This DNA has already gone through the first steps of DNA sequencing. The strips of paper represent incomplete copies of DNA that end on the left in fluorescent nucleotides. Using what you learned from the animation and interactive, determine the DNA sequence, write it in the space below, and check your answer with your teacher.

POSITION 10 9 8 7 6 5 4 3 2 1

- 3 Report your sequence to the rest of the class. In the space below, write the different sequences discovered in your class.

Questions

Write your answers on a separate sheet of paper.

- 1 In a sentence or two, briefly describe the purpose of DNA sequencing.
- 2 What role did mutations play in solving the anthrax case featured in the segment?
- 3 Just knowing the lab where the anthrax originated is not enough to solve this crime. What additional information would you like to have in order to find out exactly who sent the letter?
- 4 Summarize how your class solved the anthrax mystery.