

## Bacterial Identification (PCR) virtual lab

**Directions for the PCR and Bacterial Identification Virtual Lab:**

Read the information on the screen, do the virtual lab, and answer questions on this worksheet as you work through each section. When doing the lab (offline) in the lab classroom, you will need to find the bacterial identification folder on the old laptop and open it, or on the c drive of the new laptop. Open the explorer file that says “start here”. Be sure to allow blocked content on the old laptops so that all the animation will work. This lab can also be done online on any home computer.

**A. Orientation to the Virtual Lab**

1. Go to <http://www.hhmi.org/biointeractive/vlabs/index.html>
2. Read the paragraph about the bacterial identification lab, and then click on the “Bacterial Identification Lab” heading to begin the lab.
3. Note: if you see a window asking for registration, just close the window.
4. Read the entire “Bacterial Identification Introduction”.
5. What piece of DNA will be used in this lab? \_\_\_\_\_
6. Click on the drawing of the lab (on the left of the screen) to begin the lab.

**B. The Bacterial ID Virtual Lab**

1. DNA Sample preparation
  - a. Steps: Digest bacterial cells, inactivate enzymes at 100°C, centrifuge tube, and transfer DNA to PCR tube.
  - b. Where will the DNA be after the centrifuge spin, in the pellet or in the supernatant? \_\_\_\_\_
2. PCR amplification: What is the goal of PCR? \_\_\_\_\_
  - a. Steps: put master mix and DNA into PCR tube. Run reaction in thermal cycler. What enzyme is used for PCR? \_\_\_\_\_
  - b. At what temperature does denaturing (melting) occur? \_\_\_\_\_
  - c. How many DNA copies are there after 27 cycles (see diagram)? \_\_\_\_\_
3. PCR purification (agarose gel electrophoresis is usually done here)
  - a. How long is each DNA piece ( the PCR product)? \_\_\_\_\_ bp
4. DNA sequencing preparation (sequencing reaction)
  - a. Click “learn about cycle sequencing” and answer the question below.
  - b. What is a dideoxynucleotide? \_\_\_\_\_
  - c. What is attached to each dideoxynucleotide? \_\_\_\_\_
  - c. Click “return to part 4” and finish the lab portion.
5. DNA sequencing using the automated sequencer
  - a. Gel electrophoresis separates DNA on the basis of \_\_\_\_\_.
  - b. What charge does DNA have? \_\_\_\_\_
6. BLAST search. READ THE DIRECTIONS CAREFULLY to copy and paste your genetic sequence into the window on the BLAST website. Click on the “BLAST” button to begin the search. Follow the directions or ask for help to retrieve your results. Scroll down and look at the top of the list of names of the organisms that have DNA matching your sequence.
7. Bacterial Identity: \_\_\_\_\_ Were you correct? \_\_\_\_\_