

Name: _____

Mystery of the Crooked Cell

Patient Description Sheet

In 1904, a student from the West Indies came to a Chicago Physician, Dr. James Herrick, with a puzzling condition. Below is a summary of some of the observations Dr. Herrick made. Your job is to learn more about this condition and to find out how the disease affects the body. Read the description below and underline the information that you think may provide important clues that will help you understand the disease.

The patient reports feeling well most of the time. But he also reports odd reoccurring events. For instance, one day after a short swim he became so tired that he could hardly move. He became short of breath and complained of pain in his joints and muscles, especially the arms and legs. He felt unusually weak and required bed rest lasting a few weeks. These symptoms occurred repeatedly during his youth. He also had frequent fevers and infections.

The patient complained of fatigue and soreness in the joints. Upon inspection, the whites of his eyes had a yellowish tint. He complained of pain in the left abdominal area, which was tender to the touch.

A family history reveals that he has two brothers and three sisters. None of them have this condition. His uncle and his grandmother often had similar symptoms. His grandmother died a young woman. His parents do not have this condition.

James Herrick

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Micropipette Explanation

1 L = 1,000 mL

1 mL = 1,000 μ L

Golden Rules of Pipetting

**Don't use a pipette without a tip on it.
Don't lay down a pipette that has a tip filled with liquid.
Don't snap the plunger really hard.
Use a new pipette tip between different samples.**

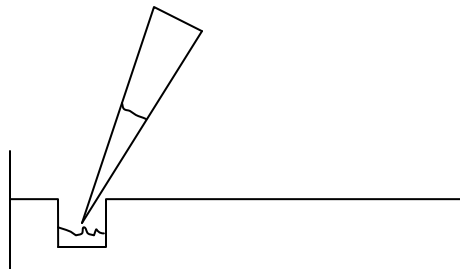
Micropipette Procedure

1. Adjust the pipette to the desired volume by turning the dial. Do not turn the dial beyond the volume range for the pipette.
2. Firmly press a new tip onto the pipette by inserting the pipette into the tip while the tip is still in the box.
3. Get tip out without touching it with your hands; this is to prevent contamination of the samples.
4. Draw up liquid from the micropipette
 1. Depress the plunger to the first stop to measure the desired volume and hold in that position.
 2. Holding the pipette vertically, immerse only the very end of the tip into the liquid to be transferred.
 3. Slowly release the plunger to draw up the liquid.
 4. Wait 1 – 2 seconds to be sure the full volume of sample is drawn up into the tip.
5. Dispense the liquid
 1. Place the tip into the container where the liquid is to be released.
 2. Slowly depress the plunger to the second stop to blow out all of the liquid in the tip.
 3. Remove tip out of liquid.
 4. Release plunger carefully.
 5. Eject tip into a waste container.

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Practice Gel Loading Exercise

1. Set the micropipette to 10 μL
2. Add a tip on the end of the micropipette.
3. Remove the lid of the practice agarose gel
4. Make sure you can clearly see the wells.
5. Microcentrifuge the practice loading dye.
6. Select a well to pipette the dye into.
7. Draw up 10 μL of loading dye.
8. Lower the tip filled with the dye into a well to be filled.
9. Carefully dispense all of the 10 μL of dye into the well.
10. Examine your practice gel to make sure that the tip did not poke through the bottom of the well or rip between the wells.
11. Repeat steps 1 – 10 until you are comfortable with loading samples onto a gel.



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Laboratory Protocol

Name: _____

- 1. Set micropipette to 20 μL .
- 2. Use micropipette to draw up and dispense samples.
- 3. Don't forget to change tips between samples.
- 4. Load 20 μL of sample N into a well of the gel.
 - Identify Sample N _____
- 5. Don't forget to change tips between samples.
- 6. Load 20 μL of sample S into a well of the gel.
 - Identify Sample S _____
- 7. Don't forget to change tips between samples.
- 8. Load 20 μL of the sample P into a well of the gel.
 - Identify Samples P _____
- 9. Eject tip into waste container.
- 10. Record data onto Data Sheet provided.

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Data Sheet

1. Observe the photographs of the different blood samples. Describe the differences you see between the two blood samples.

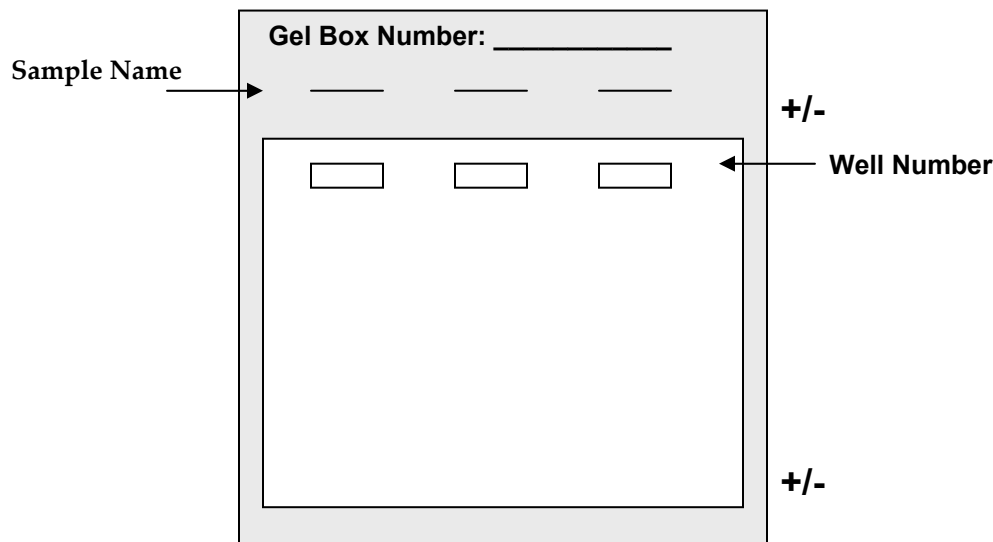
Normal Red Blood Cells	Patient's Red Blood Cells

2. When analyzing your gel results do you see a difference between the normal and sickle cells hemoglobin controls?

3. Compare the patient's hemoglobin to the normal and sickle cell controls used for your gel; which one is it similar to?

Patient's Hemoglobin	Normal Control	Sickle Cell Control

4. Draw your results from your gel. Be sure to label the wells with sample names, positive and negative electrodes, and gel box number.



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Data Analysis

1. Why are you loading your samples onto an agarose gel?

2. What does each sample represent?

Sample N

Sample S

Sample P

3. Does the hemoglobin in sample P look more like hemoglobin from sample N or Sample S?

4. What is your diagnosis for the patient?

5. Explain to your patient how you determined their test results.

6. Write down some of the precautions the sickle cell patient may want to consider.
