

Grant College Prep and Digital Arts Magnet

AP Biology Summer Assignment: *The Immortal Life of Henrietta Lacks*

Instructor: Dr. Bryant

DIRECTIONS

1. Read *The Immortal Life of Henrietta Lacks* by Rebecca Skloot and then answer the discussion questions from the Random House Reading Guide listed below.
 2. Include your name, course, due date and title on top of assignment as your heading.
 - Prologue, Chapters 1-11 and #s 1-8 of Chapters 12-20 due by July 30th via e-mail or shared as a Google Doc with Dr. Bryant at Darlene.lands@lausd.net
 - #s 9-18 from Chapters 12-20, Chapters 21-36 and Overall Questions due by August 1 via e-mail or shared as a Google Doc with Dr. Bryant at Darlene.lands@lausd.net
 3. Assignment must be typed (12 pt font) and answers should be clearly labeled & numbered for each chapter. Answer completely and in full sentences. Use good grammar and spelling (AP style) but be clear and concise; discussion should be in your own words even if page numbers are referenced.
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Prologue: The Woman in the Photograph

1. What happens when there is a mistake during the process of mitosis?
2. According to Defler, how important was the discovery of HeLa cells?

Chapters 1-11

1. What did Howard Jones find “interesting” about Henrietta’s medical history? What does this finding suggest about Henrietta’s cancer?
1. How are different types of cancer categorized?
2. Summarize Dr. TeLinde’s position in the debate over the treatment of cervical cancer.
3. Explain how the development of the Pap smear improved the survival rate of women diagnosed with cervical cancer.
4. How did TeLinde hope to prove that his hypothesis about cervical cancer was correct?
5. Explain what an immortal cell line is.
6. Summarize the main obstacles Gey and his assistants faced in their effort to grow cells.
7. Where did the name “HeLa” come from?
8. What happened to the HeLa cells that Mary cultured?
9. What did Gey hope to accomplish with HeLa cells?
10. What did HeLa allow scientists to do for the first time?
11. How did the media react to Carrel’s announcement that he had grown immortal chicken heart cells?
12. What details suggest that Carrel’s claims about the immortal cell line were not scientifically sound?
13. After her initial round of treatment, what did Henrietta’s doctors assume about the effectiveness of the radium therapy?
14. Describe the progression of Henrietta’s cancer in the eight months between her diagnosis and her death.

Chapters 12-20:

1. Explain how a neutralization test is used to determine a vaccine's efficacy.
2. What unusual characteristics of HeLa cells made them ideal for use in the polio vaccine trials?
3. Paraphrase the explanation of how a virus reproduces found on page 97. Why did the fact that HeLa cells are malignant make them particularly useful in the study of viruses?
4. Why was the development of methods of freezing cells an important scientific breakthrough?
5. Why did scientists want to be able to clone cells for research?
6. Explain the contribution that HeLa made to the emerging field of genetics.
7. Describe the experiment that Southam developed to test his hypothesis about HeLa.
8. What was the result of Southam's first research study? Based on these results, did his hypothesis appear to be correct?
9. Based on the results of the second study, what two things did Southam believe that injections of HeLa cells might be able to do?
10. How did Southam justify his decision to inject HeLa cells into patients without their knowledge or consent?
11. Summarize the various ways that HeLa was used in the space program.
12. What disturbing discovery did scientists make about the way HeLa responded in orbit?
13. Explain what happens during somatic cell fusion.
14. What scientific discoveries were made possible as a result of fused hybrid cells?
15. How was Gartler able to link the contamination problem to HeLa?
16. What unique abilities did HeLa have that allowed it to contaminate cultures without researchers being aware that contamination had occurred?
17. Why would HeLa contamination be a problem for researchers?
18. What is "spontaneous transformation"? What did Gartler suggest about spontaneous transformation?

Chapters 21-36:

1. What was the purpose of President Nixon's National Cancer Act?
2. Why did advances in genetic research necessitate establishing the legal requirement that doctors or researchers obtain informed consent documentation prior to taking DNA samples from patients for research?
3. Describe the lawsuit that set a legal precedent for patenting biological "products" such as cell lines.
4. Summarize the pros and cons of giving patients legal ownership of their cells.
5. What was the Supreme Court of California's decision regarding the Moore lawsuit? Summarize the reasoning behind the decision.
6. Explain how the human papillomavirus (HPV) causes cervical cancer.
7. Are scientists able to definitively explain why HeLa grew so powerfully?
8. Describe the contribution that HeLa has made to research on the HIV virus and the AIDS epidemic.
9. Explain Van Valen's theory that HeLa cells are "no longer human." Was his theory accepted by the scientific community?
10. Explain the Hayflick limit. Why are HeLa cells able to live beyond the Hayflick limit?
11. Summarize Gary's spiritual explanation for why Henrietta's cells lived on after her death.

Overall Questions:

1. There is often a tension between religious faith and science. Explore the importance of both religious faith and scientific understanding in the lives of the Lacks family. How does religious faith help frame the Lackses' response to, and interpretation of, the scientific information they receive about HeLa? How does Skloot's attitude toward the relationship between religious faith and science evolve as a result of her relationship with the Lacks family?
2. Using the book as a guide, describe the process of scientific inquiry. Examine the often contradictory forces of altruism and profit as they influenced research related to HeLa. What are the risks and benefits of allowing profit to guide research? What are the obstacles involved with conducting research purely for altruistic reasons?
3. Create a time line that begins with the removal of Henrietta's tissue sample and traces the scientific and medical breakthroughs that have been made possible as a result of HeLa cells. Explain how HeLa cells were used in each situation.