In Chapter 5, you have learned that cancer is a disease that results from a breakdown in the regulation of the cell cycle. A great deal of scientific research has been—and is being—carried out on cancer cells so scientists can learn more about these diseases. Where did these cancer cells come from?

STANDARD CELL LINES

To avoid introducing an additional variable in their experiments and to make their experiments repeatable, researchers use standard cell lines—cells that have been cultured in the lab and are available to the scientific community. Most cells live for a short time outside the body, then age and die. A few cell lines are considered to be immortal because they continue to grow and divide indefinitely when provided with the correct culture conditions. HeLa cells are an example of an immortalized cell line. They have been grown under laboratory conditions for thousands of cell generations and are used extensively in medical research. HeLa cells are human epithelial cells from a fatal cervical tumor. Here is their story.

HELA CELLS

In 1951, Henrietta Lacks, a 31-year-old, African-American mother of five children, died of cervical cancer in Baltimore. Before she died, doctors removed some of the cells from her tumor and delivered them to Dr. George Gey, head of tissue culture research at the Johns Hopkins University. Dr. Gey was looking for cells that would continue to grow and divide in the lab. He grew the tumor cells in his test tubes and was amazed at how fast they divided and how strong they were. Within a few months of Henrietta’s death, her cells were still alive, and Dr. Gey was using them to grow polio viruses. But neither Henrietta nor her family knew that her cells had been taken and that they lived on.

Gey named the cells HeLa after the first two letters of Henrietta’s first and last names. HeLa cells were—and still are—among the strongest cells known to science. Especially valuable was their ability to divide every 24 hours. Dr. Gey sent them to researchers around the world. Demand grew, and the cells were soon mass-produced. And still Henrietta’s family did not know of their existence. The cells were used in cancer and AIDS research, in creating a polio vaccine, in gene mapping, in testing the effects of radiation and drugs, and in many other types of medical research. HeLa cells were even sent to space on the space shuttle at one point.

By the early 1970s, some researchers began to suspect that HeLa cells had contaminated their other cell lines. They couldn’t be sure because they had little information about the identity of HeLa cells. DNA testing was unknown in the 1950s, when the HeLa line originated. At about the same time, Henrietta’s children discovered by accident that their mother’s cells still existed. They contacted the Johns Hopkins University and were asked to donate blood and tissue samples.

Researchers say the family was told that the tissue samples were needed so the HeLa cells could be genetically identified. Family members say they were told that the samples were needed to see if they were at risk of developing the same kind of cancer that killed Henrietta. They tried to get information from the researchers, but their questions went unanswered. To this day, the Lacks family has not received any compensation for the widespread use of Henrietta’s cells.
ETHICAL CONSIDERATIONS

Several ethical questions about the HeLa-cell story can be raised. Who owns Henrietta’s cells? Do researchers need consent to take and use cells from a person? Does it matter that the cells are cancerous? Should Henrietta’s family have been compensated for use of her cells? How do you place a monetary value on cells? Should this value vary according to their commercial value? Are cells worth more if they are used to develop a profitable vaccine?

BIOMEDICAL ETHICS

Today, people who work in the field of biomedical ethics try to answer or address the questions and concerns raised by situations such as Henrietta’s. When patients go into a hospital for surgery, many will sign a form to indicate whether their tissues can be used for research, and they are promised that these samples will not be taken without their consent. However, many issues have not yet been resolved. Hospitals have thousands of blood and tissue samples already stored, and there are no rules governing who has access to these samples. Some bioethicists want laws passed that will require researchers to get permission before using tissue samples for research. Many researchers think that this requirement will slow or prevent scientific research.

The issue of who owns your cells and whether you can sell them also can be confusing. For example, you can sell your blood and your eggs or sperm, but you cannot sell your kidney. Does the human body have a price tag?

DEBATE

Consider the many ethical questions raised by the HeLa story. Conduct library or Internet research on these issues and the different points of view. Decide whether you think a person owns his or her cells or whether you think researchers should be able to use them freely. Consider whether a patient’s identity should be protected or whether he or she should be identified.

Now, consider whether you would argue for or against some kind of monetary compensation for the use of Henrietta Lacks’ cells, or what kind of legislation you think should be passed to deal with these matters. Imagine that you are a lawyer and you are making opening remarks to a judge or jury on this issue, or you are an advocate testifying before the government on what kind of laws should be written to resolve such issues. What are the main issues? What is at stake?