The Miracle Woman

By Rebecca Skloot

From the February 2010 issue of *O, The Oprah Magazine*

In 1951, at the age of 30, Henrietta Lacks, the descendant of freed slaves, was diagnosed with cervical cancer—a strangely aggressive type, unlike any her doctor had ever seen. He took a small tissue sample without her knowledge or consent. A scientist put that sample into a test tube, and, though Henrietta died eight months later, her cells—known worldwide as HeLa—are still alive today. They became the first immortal human cell line ever grown in culture and one of the most important tools in medicine: Research on HeLa was vital to the development of the polio vaccine, as well as drugs for treating herpes, leukemia, influenza, hemophilia, and Parkinson's disease; it helped uncover the secrets of cancer and the effects of the atom bomb, and led to important advances like cloning, in vitro fertilization, and gene mapping. Since 2001 alone, five Nobel Prizes have been awarded for research involving HeLa cells.

There's no way of knowing exactly how many of Henrietta's cells are alive today. One scientist estimates that if you could pile all the HeLa cells ever grown onto a scale, they'd weigh more than 50 million metric tons—the equivalent of at least 100 Empire State Buildings.

Jones called Henrietta on February 5, 1951, after getting her biopsy report back from the lab, and told her the tumor was malignant. Henrietta didn't tell anyone what Jones said, and no one asked. She simply went on with her day as if nothing had happened, which was just like her—no sense upsetting anyone over something she could just deal with herself.

The next morning Henrietta climbed from the Buick outside Hopkins again, telling Day and the children not to worry.

"Ain't nothin' serious wrong," she said. "Doctor's gonna fix me right up."

Henrietta went straight to the admissions desk and told the receptionist she was there for her treatment. Then she signed a form with the words operation permit at the top of the page. It said:

*I hereby give consent to the staff of The Johns Hopkins Hospital to perform any operative procedures and under any anaesthetic either local or general that they may deem necessary in the proper surgical care and treatment of:*_____.

Henrietta printed her name in the blank space. A witness with illegible handwriting signed a line at the bottom of the form, and Henrietta signed another.

Then she followed a nurse down a long hallway into the ward for colored women, where Howard Jones and several other white physicians ran more tests than she'd had in her entire life. They checked her urine, her blood, her lungs. They stuck tubes in her bladder and nose.

Henrietta's tumor was the invasive type, and like hospitals nationwide, Hopkins treated all invasive cervical carcinomas with radium, a white radioactive metal that glows an eerie blue. So the morning of

Henrietta's first treatment, a taxi driver picked up a doctor's bag filled with thin glass tubes of radium from a clinic across town. The tubes were tucked into individual slots inside small canvas pouches hand-sewn by a local Baltimore woman. One nurse placed the pouches on a stainless steel tray. Another wheeled Henrietta into the small colored-only operating room, with stainless steel tables, huge glaring lights, and an all-white medical staff dressed in white gowns, hats, masks, and gloves.

With Henrietta unconscious on the operating table in the center of the room, her feet in stirrups, the surgeon on duty, Lawrence Wharton Jr., sat on a stool between her legs. He peered inside Henrietta, dilated her cervix, and prepared to treat her tumor. But first—though no one had told Henrietta that TeLinde was collecting samples or asked if she wanted to be a donor—Wharton picked up a sharp knife and shaved two dime-size pieces of tissue from Henrietta's cervix: one from her tumor, and one from the healthy cervical tissue nearby. Then he placed the samples in a glass dish.

Wharton slipped a tube filled with radium inside Henrietta's cervix, and sewed it in place. He then sewed a pouch filled with radium to the outer surface of her cervix and packed another against it. He slid several rolls of gauze inside her vagina to help keep the radium in place, then threaded a catheter into her bladder so she could urinate without disturbing the treatment.

When Wharton finished, a nurse wheeled Henrietta back into the ward, and a resident took the dish with the samples to Gey's lab, as he'd done many times before. Gey still got excited at moments like this, but everyone else in his lab saw Henrietta's sample as something tedious—the latest of what felt like countless samples that scientists and lab technicians had been trying and failing to grow for years.

Gey's 21-year-old assistant, Mary Kubicek, sat eating a tuna salad sandwich at a long stone culture bench that doubled as a break table. She and Margaret and the other women in the Gey lab spent many hours there, all in nearly identical cat's-eye glasses with fat dark frames and thick lenses, their hair pulled back in tight buns.

"I'm putting a new sample in your cubicle," Gey told Mary.

She pretended not to notice. "Not again," she thought, and kept eating her sandwich. Mary knew she shouldn't wait—every moment those cells sat in the dish made it more likely they'd die. But they always died anyway. "Why bother?" she thought.

At that point, there were many obstacles to growing cells successfully. For starters, no one knew exactly what nutrients they needed to survive or how best to supply them. But the biggest problem facing cell culture was contamination. Bacteria and a host of other microorganisms could find their way into cultures—from people's unwashed hands, their breath, and dust particles floating through the air—and destroy them. Margaret Gey had been trained as a surgical nurse, which meant sterility was her specialty—it was key to preventing deadly infections in patients in the operating room.

Margaret patrolled the lab, arms crossed, leaning over technicians' shoulders as they worked, inspecting glassware for spots or smudges. Mary followed Margaret's sterilizing rules meticulously to avoid her wrath. Only then did she pick up the pieces of Henrietta's cervix—forceps in one hand, scalpel in the other—and carefully slice them into one-millimeter squares. She sucked each square into a pipette, and dropped them one at a time onto chicken-blood clots she'd placed at the bottom of dozens of test tubes. She covered each clot with several drops of culture medium, plugged the tubes with rubber stoppers, and wrote "HeLa," for Henrietta and Lacks, in big black letters on the side of each tube. Then she put them in an incubator.

For the next few days, Mary started each morning with her usual sterilization drill. She'd peer into all the

incubating tubes, laughing to herself and thinking, "Nothing's happening." "Big surprise." Then she saw what looked like little rings of fried egg white around the clots at the bottom of each tube. The cells were growing, but Mary didn't think much of it—other cells had survived for a while in the lab.

But Henrietta's cells weren't merely surviving—they were growing with mythological intensity. By the next morning, they'd doubled. Mary divided the contents of each tube in two, giving them room to grow, and soon she was dividing them into four tubes, then six. Henrietta's cells grew to fill as much space as Mary gave them.

Still, Gey wasn't ready to celebrate. "The cells could die any minute," he told Mary. But they didn't. The cells kept growing like nothing anyone had seen, doubling their numbers every 24 hours, accumulating by the millions. "Spreading like crabgrass!" Margaret said. As long as they had food and warmth, Henrietta's cancer cells seemed unstoppable.

Soon, George told a few of his closest colleagues that he thought his lab might have grown the first immortal human cells.

To which they replied, Can I have some? And George said yes.

George Gey sent Henrietta's cells to any scientist who wanted them for cancer research. HeLa cells rode into the mountains of Chile in the saddlebags of pack mules and flew around the country in the breast pockets of researchers until they were growing in laboratories in Texas, Amsterdam, India, and many places in between. The Tuskegee Institute set up facilities to mass-produce Henrietta's cells, and began shipping 20,000 tubes of HeLa—about six trillion cells—every week. And soon, a multibillion-dollar industry selling human biological materials was born.

HeLa cells allowed researchers to perform experiments that would have been impossible with a living human. Scientists exposed them to toxins, radiation, and infections. They bombarded them with drugs, hoping to find one that would kill malignant cells without destroying normal ones. They studied immune suppression and cancer growth by injecting HeLa into rats with weak immune systems, who developed malignant tumors much like Henrietta's. And if the cells died in the process, it didn't matter—scientists could just go back to their eternally growing HeLa stock and start over again.

But those cells grew as powerfully in Henrietta's body as they did in the lab: Within months of her diagnosis, tumors had taken over almost every organ in her body. Henrietta died on October 4, 1951, leaving five children behind, knowing nothing about her cells growing in laboratories around the world.

Henrietta's husband and children wouldn't find out about those cells until 25 years later, when researchers from Johns Hopkins decided to track down Henrietta's family to do research on them to learn more about HeLa.

When Henrietta's children learned of HeLa, they were consumed with questions: Had scientists killed their mother to harvest her cells? Were clones of their mother walking the streets of cities around the world? And if Henrietta was so vital to medicine, why couldn't they afford health insurance? Today, in Baltimore, her family still wrestles with feelings of betrayal and fear, but also pride. As her daughter Deborah once whispered to a vial of her mother's cells: "You're famous, just nobody knows it."