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Movie Aims to Inspire College Students With Tales of Successful Minority Scientists

Tarsha Ward remembers begging her mother for a stethoscope so she could be the star of career day at her kindergarten class in Charleston, S.C. Her mother presented her with something that proved more prophetic: a white lab coat.

“For me that was the beginning of a career,” said Ward, who is working toward her doctorate in biomedical sciences at Morehouse School of Medicine in Atlanta, Ga., focused on cancer research. “Ever since then everything was about science.”

For Adrienne W. Hill, the path to a career in physics was even more personal. At 5, she was in awe of her great uncle who she viewed as either very tall or just her size depending on whether he was wearing his artificial legs. She now uses her physics background to help others by designing and fitting the prosthetics that transform their lives.

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Both women are featured in a student-produced documentary film that highlights the careers of African American female scientists. Made possible through a grant from the Howard Hughes Medical Institute (HHMI), the hour-long film examines the choices and experiences of graduates of Spelman College, a historically black women’s college in Atlanta, as they pursue careers in science.

African American women are still rare in many science professions, despite their increasing representation in undergraduate science classes. The documentary—*Roots to STEM: Spelman Women in Science*—seeks to explore how these women were able to succeed and to hold them up as role models.

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“You learn from their narratives what the issues are for these young black women pursuing a variety of (career) tracks,” said Cynthia Bauerle, who oversaw the original development of the documentary as a biology professor at Spelman and has since joined HHMI as a senior program officer. “We are trying to get at what are the things that sustain them in their programs and what challenges them.”

Lights, camera, science The student filmmakers—cousins Deven Sanders, who will graduate from Spelman in 2010, and Cydnee Bayless, who graduated in May 2009—captured the scientists on high-definition video, interviewing them at work and at home, as they reflected on their careers. All of the participants—who range from dentist to pediatrician to pharmaceutical researcher—graduated within the last seven years.

After the filming was finished, Bayless and Sanders were left with a total of 24 hours of film to edit. And although most of the footage didn’t make it into the one-hour movie, none was lost, Bauerle said. The interviews will be mined for information to help focus a mentoring program for African American women in the biological sciences that HHMI funds at Spelman. Bauerle hopes these stories will help the faculty members understand how mentoring can encourage students to stay in the science. “They can edit all they want,” Bauerle said of the two student filmmakers, who spent the past summer weaving the many stories into one. “But I wanted them to save the footage.”

Sanders and Bayless, were chosen to make their first feature-length film, hope that viewers of their documentary will be as inspired by the passion and dedication of these women as they were when they heard the stories for the first time. “This is a great way for incoming students who are undecided about what to do, but passionate about medical fields, to be shown what they can be,” Sanders said.

The choice of using student filmmakers was deliberate. “We really wanted students because we wanted as little filtering as possible,” Bauerle said. “The idea was really for these alumnae to tell their own stories.”

From physics to prosthetics And they definitely have stories to tell.

In March, the filmmakers interviewed Hill at the suburban Atlanta office of Hanger Prosthetics and Orthotics, where she offered a behind the scenes look at how artificial limbs are fit and manufactured. Hill now uses her physics background daily, applying her understanding of phenomena such as sinusoidal waves to analyze how patients walk and designing prosthetics to conserve energy in their gait pattern.

That particular segment of the film was full of the drama of a 93-year-old man who lost his leg to cancer and was being measured and fit for an above-the-knee prosthesis. “She took us step by step,” said Bayless just after the shoot, bubbling with enthusiasm. “It was like second nature for her.”

The next day, for the background interview at her condo overlooking Centennial Olympic Park in downtown Atlanta, Hill sat rod straight, with the athletic bearing of the ex-field hockey player that she is, and told the filmmakers about her history and influences.

With the camera rolling Hill explained that growing up in Washington, D.C., she and her older brother loved taking apart things such as TVs and lawn mowers and putting them back together. She also was curious about prosthetics early on because her uncle, who lost his legs while serving in the Army, and her father, who needed an ankle-foot orthosis brace as the result of a car crash. This 24-year-old with a photographic memory can’t remember wanting to be anything other than a prosthetist (a maker of artificial limbs). “My field is so small nobody knows about it unless it’s affected their family,” she said.

Bayless and Sanders nodded empathically and asked follow-up questions to flesh out the young woman’s narrative. “It seems like you’re rolling smooth, but have there been any struggles in getting to do what you wanted to do?” asked Sanders, who has the low, strong voice of a broadcaster.

More stories come pouring out: she had to overcome a few disappointing grades before physics clicked with her, but she went on to become a member of the National Physics Honors Society and graduate Magna Cum Laude.

Even before the documentary was complete, Spelman English professor Tarshia Stanley, who served as an advisor on the project, found this footage some of their most compelling. “(The students) managed to bring a hidden profession to life in a way I really appreciate,” she said.

Unexpected history lesson Sanders and Bayless squeezed their filmmaking into their jam-packed schedules during the spring 2009 semester. But from the start they paid attention to details. Setting up for a sit-down interview with Ward, the cancer researcher who works with advisor Xuebiao Yao, they surveyed the conference room she’d set aside for them. A plain backdrop wouldn’t do, but a blackboard in the corner, covered with notes scribbled from a previous meeting— Slide #2, ezrin (green) and DNA (blue)—conveyed the research setting.

Ward, a petite, soft-spoken woman dressed like the grad student she is in jeans and a t-shirt, was immediately at ease with her Spelman sisters despite the two cameras they have trained on her.

With the filmmakers questions to guide her, Ward worked her way through her story from kindergarten to graduate school. As they crossed the hall for a tour of the lab where Ward works at Morehouse, the filmmakers elicited information about her grueling schedule. Ward's days often last longer than 12-15 hours and stretch into the late night. She doesn't mind the hours because she's doing what she loves—learning how cell growth is regulated and what happens to cells when they can't maintain their plasticity. Problems that interrupt these basic biological processes can lead to both cancer and degenerative diseases. She often finds herself lingering in the lab wrestling with a problem alone. It's a process she's grown to love.

"If you get into a bind you have to think it out yourself," she said. "A Ph.D. has really taught me to think on my own. You're here thinking in the midnight hours and there's no book to tell you what's right. You just have to see if it works."

Such struggles have already paid off. "In seven months, I published my first paper. I worked on it day and night," said Ward, a 2004 Spelman graduate. "I (loved) the fact that I could find something no one else could find and actually publish it."

As the camera captured her, white lab coat on and gel plates in hand, an unprompted history lesson spilled out. It's right on target for the film: "These HeLa cells originally came from Henrietta Lacks, a black woman who was sick with cervical cancer," said Ward, talking about the cells that are commonly used as an experimental model. "They took it without her knowing. Her family didn't find out for years that her cells were in everybody's lab."

Scientists like me Like many of the gifted researchers and practitioners produced by Spelman, Ward aches to see more African American women in science.

At her first meeting of the American Society for Cell Biology, she realized that as a black woman she was an anomaly in this organization of more than 11,000 members. "When I went through the hall I broke down," she said. "It was really a shock to me that we're missing in that area."

Hill also knows that feeling. About seven percent of prosthetists in the U.S. are African American and about three percent of those black prosthetists are women, she said. "Especially in my field I'm a complete double minority," she said.

Ward hopes her path inspires other young black women to follow their passion and overcome these statistics. After the September 17 premiere at Spelman, the film will be shown in the Atlanta area, where its creators hope it will inspire students of all ages. "If fourth-graders see I got there, maybe they'll think they can, too," she said.

The documentary offers the intimate insight that can achieve that goal, Stanley said. “You get to spend some time with the subjects of the documentary, you get to hear their voices, see their facial expressions and I think those experiences help audiences to translate what they see into a viable reality.”