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PEOPLE & IDEAS

Rita Colwell: Use your voice to bring about positive change

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Rita Colwell is a Distinguished University Professor at the University of Maryland at College Park and at Johns Hopkins University Bloomberg School of Public Health, senior advisor and chairman emeritus at Canon US Life Sciences, Inc., founder and chairman of CosmosID, Inc., and president of the Rosalind Franklin Society. She has authored or co-authored 20 books and more than 800 scientific publications, and throughout her career has focused on improving health outcomes across the world and highlighting the impacts of infectious diseases in drinking/bathing water. We recently spoke to Rita about her career and her thoughts about the future for women in science.

How did you first become interested in science, and can you share a bit about your early journey, including getting into grad school and beyond?

I became interested in science as a child growing up in Beverly Cove, Massachusetts, exploring nature and tide pools. My sister's boyfriend and future husband, a Dutch physicist, introduced me to captivating conversations about physics and chemistry. Despite facing challenges as a woman in science, I pursued chemistry, eventually choosing Purdue University for a scholarship. This decision led to a fulfilling journey in science, embedding me in the world of research and technology.

What is your current position, and how do you spend most of your time in terms of your work?

I am very happily a Distinguished University Professor at the University of Maryland. I'm allowed to do research, I'm provided with a laboratory and an assistant, and I have a very bright graduate student who just completed his PhD and is staying on as a postdoc. My focus is on pandemic prediction, leveraging 50 years of research on cholera in regions like Bangladesh and Latin America where we have developed a very strong understanding of the environmental drivers. Using satellite sensing and computational modeling, we provide risk maps for various locations, including Ethiopia and Malawi, aiding UN agencies and humanitarian efforts. Additionally, my work extends to studying other vibrios and their distribution, especially in the context of climate-related infectious diseases, so we're very much in demand! We utilize satellite sensing to monitor environmental drivers like surface temperature and chlorophyll, linked to vibrios' presence. This approach aids in predicting and mapping the risk of infectious diseases. For instance, in Florida, we detected signals predicting cases of vibrio infections weeks in advance, leading to proactive measures. This method, developed through collaboration with Antarpreet Jutla, from the University of Florida, showcases the impact of climate-related studies on infectious diseases.

Throughout your career, you've highlighted and supported women in science. What prompted you to engage in such initiatives, and do you think there's still a need for them today?

I recently wrote a book entitled *A Lab of One's Own: One Woman's Personal Journey Through Sexism in Science*, which describes

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what I had to go through in my career. I was really at the cusp, in that my oldest sister would have no future career choice except as a secretary or a nurse, and I was allowed to enter university and work in the 1960s just when the revolution was taking place, so I had to live through all of that. For example, at Purdue University there were really only two women professors: one in physics and one in microbiology. Fortunately, the woman professor was exceedingly good, and she was the one that really inspired me to become a microbiologist. The experiences of gender discrimination I faced in my early career,

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including the lack of women professors at Purdue University, inspired me to support women in science. Despite facing discrimination, I excelled as an undergraduate and eventually became a microbiologist.

Can you elaborate on the challenges you faced, particularly when seeking a fellowship for your master's studies, and how those experiences shaped your career decisions?

When seeking a fellowship for my master's studies, the department chair at Purdue University bluntly stated, "We don't waste fellowships on women." This rejection led me to explore an alternative—a research assistantship (RA) in genetics. Despite the initial setback, I thrived in fundamental genetics. Later, when considering medical school, I faced challenges due to residency requirements, and a professor who did not want women students. Subsequently, I joined a new marine microbiology program led by a professor from Scotland. Working as a technician, I eventually became his first graduate student, marking the beginning of my pioneering role in marine microbiology. The university's first computer, an IBM 650, enabled me to write the initial program for bacterial identification using computers.

Considering your experiences, what advice would you give to women facing challenges or discrimination?

My advice is to use humor, not anger, to navigate challenges. During my career, I witnessed the power of humor in addressing discrimination. It's crucial for women to speak out against injustice and support each other, using their voices to bring about positive change.

Experiencing gender discrimination in my early career inspired me to support women in science. Initiatives like the Rosalind Franklin Society play a crucial role by publicizing women's achievements, ensuring nominations for awards, and promoting their recognition. Despite improvements, covert discrimination persists, making such societies essential for fostering gender equality and providing a platform for women's voices.

As the president of the Rosalind Franklin Society, how can individuals get involved, and what initiatives does the society undertake to support women in science?

The society organizes an annual meeting, providing a platform for networking and learning. Individuals can subscribe to the newsletter to stay updated on women's achievements. The society's focus on publicizing appointments and board positions ensures visibility and opportunities for women in various fields, contributing to their career advancement.

Have you witnessed or initiated any effective initiatives that promote women's involvement in leadership roles or committees in science?

The ADVANCE program at the National Science Foundation, initiated during my tenure, specifically supported women returning to science after childbirth or caregiving. By providing funding to universities, it empowered women to resume their careers successfully. This competitive program, celebrating its 20th anniversary, has positively impacted thousands of women faculty members.

Do you feel optimistic about the future of women in science, considering the changes and challenges?

I am guardedly optimistic about the future of women in science. The #MeToo movement empowered women to speak out against discrimination and harassment. However, concerns about the lack of civility and crude behavior persist. While challenges exist, women's voices are becoming more prominent, and initiatives like the Rosalind Franklin Society contribute positively to fostering gender equality. Women are increasingly speaking out, and the progress made over the years is promising.