

Dr. Kristen Rhinehardt, NC A&T State University

Dr. Kristen L. Rhinehardt is an Associate Professor in computational data science and engineering at North Carolina A&T State University (NC A&T), one of the Researcher Academy's inaugural Institutional Champions. Since 2022, her involvement with the academy has enabled many NC A&T students to actively work with the Researcher Workbench and its historic dataset.

This access provides them with expanded training and hands-on experience as they pursue degrees and careers in health research. "The ease of use and the support network that the Researcher Academy has built around the platform add significant value for new and early-career researchers," says Dr. Rhinehardt.

NC A&T—a top-flight research university based in Greensboro, NC—is the largest Historically Black University (HBCU) in the country and is nationally recognized for excellence in science, technology, mathematics, and engineering education.

As a faculty member there since 2019, Dr. Rhinehardt explains why it is so important for HBCUs like NC A&T to actively engage with the *All of Us* Research Program data. "As of 2022, 70% of Black dentists and physicians, 50% of Black teachers, and 40% of Black engineers earned degrees at HBCUs," she says. "This network not only impacts the education of these professionals but brings awareness to our communities on the importance and impact of the *All of Us* Research Program."

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In addition, she stresses that trust is vital in healthcare. "Like any issue, awareness is key to understanding and addressing the problem," she says. "*All of Us* has brought attention to an information gap that has had a direct impact on healthcare approaches and treatment."

Dr. Rhinehardt can trace the passion and motivations that have shaped her career to early experiences as a child. When she was just 5 years old, her father was diagnosed with kidney disease and congestive heart failure. She recalls then and there declaring she was going to be a doctor so that she could make him well. "I remember the day the doctor told us that a heart transplant was not an option because we could not afford the nearly million-dollar price tag to get on the list and pay for the surgery," she said. "Afterward, I witnessed how the dialysis that was supposed to extend his life slowly harmed his heart, mind, and spirit. In furthering my education, I learned this cyclic phenomenon was present in the treatment of many diseases."

In the pursuit of her studies, Dr. Rhinehardt dedicated much of her secondary and post-secondary education to understanding diseases at the genomic and molecular level. Her ultimate goal was to aid in the early detection and treatment of disease. In 2010, she graduated from Cornell University with a minor in biomedical engineering and a degree in biological engineering. Later she worked with patients, technicians, and researchers in both clinical and academic settings.

As time went on, she concentrated her efforts on bridging the gap between medicine and engineering. In 2012, she completed her master's degree at NC A&T, becoming the first person there to earn a degree in nanoengineering. In 2015, she earned her Ph.D. in nanoengineering focusing on *in vitro* and *in silico* biosensor design. "It is so vital," she says, "to educate future engineers on the importance of engineering in the medical field."

Currently, Dr. Rhinehardt is the director and founder of the Computational Molecular Engineering Lab at NC A&T, where she is committed to conducting research that improves the quality and understanding of

biological systems while bridging the gaps between communities and technological advancement. "In my lab, our goal is to foster interdisciplinary, molecular-level, computing-enabled research in genomics, material science, drug discovery, and biosensors," she says. "We are making a difference bit by bit."

She is expanding her efforts as the Principal Investigator and Co-Director of the Genomic Research and Data Science Center for Computation and Cloud-Computing (GRADS-4C). This is a \$5.8M effort supported by the National Institutes of Health's National Human Genome Research Institute, the *All of Us* Research Program, the Office of Data Science Strategy, and the National Institute on Minority Health and Health Disparities. "Our mission is to bring training and information in computational genomics, data science, and cloud computing research to students, faculty, and communities—particularly those among historically marginalized populations."

And what advice does Dr. Rhinehardt have for her students who also want to make a difference and follow her lead to a career in research? "Multidisciplinary computational work is a challenging and rewarding field," she affirms. "But remember, research is the systematic exploration of a query to understand the facts. Though it may not fall into your expected solution or predicted outcome, continue to be inquisitive and persistent." ■

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