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Rising Electrochemist Generates More than Energy When Translating Her Work in Transforming Waste Molecules

Former SCGSR participant makes it to the National Research SLAM

By Bethany Lee

For Krista Kulesa, science isn't just a discipline—it's a language that translates the mysteries of the natural world. With a PhD in inorganic chemistry and a MA in Ancient Greek and Latin, Kulesa's views of chemistry as its own language earned her a spot at the second annual National Lab Research SLAM. Kulesa represented Pacific Northwest National Laboratory (PNNL) in the energy security category, as one of 17 total Department of Energy (DOE) national laboratory early-career scientists delivering compelling three-minute talks on their research.

"It is shockingly difficult to communicate your science at such a high level, and I think people underestimate the challenge involved in that," said Kulesa. "Although the SLAM was a competition, by the time we all went up on stage, everyone was just so proud of each other. It was the most supportive environment you could dream of, and I feel amazing that I was given the opportunity to participate."

As a former participant in the Workforce Development for Teachers and Scientists [Office of Science Graduate Student Research \(SCGSR\)](#) program, Kulesa is currently an electrochemist and Linus Pauling Distinguished Postdoctoral Fellow at PNNL. Her expertise in high-throughput experimentation drives advancements in energy technologies, water and wastewater treatment, chemical transformations and separations, and beyond. Her presentation, "Conducting Chemical Reactions: The Symphony of Electrochemistry," likened electrochemistry to orchestrating a symphony—directing electrons to make and break chemical bonds in harmony.

"I've learned many valuable communication skills during my career," she shared. "You work with all kinds of people throughout your life, whether in chemistry or antiquities. Every time I pivot between different sets of colleagues, I learn new ways to convey myself. In many ways, people are languages too!"



Krista Kulesa joined PNNL as a Pauling Fellow after the completion of the SCGSR program. (Photo by Graham Bourque, PNNL)



Krista Kulesa, former SCGSR participant, presents her research at the National Research SLAM. (Photo by Blaise Douros, LLNL)

The SLAM took place on Wednesday, March 5, 2025, in Washington, D.C., and Kulesa didn't let fear or nerves prevent her from participating—much like when she applied for the SCGSR program in 2019. When a beloved mentor passed away during the initial Covid outbreak, she opted to defer her application. Nervous about moving 1,300 miles away from home during the pandemic, Kulesa said she felt in her bones that she needed to take a leap of faith before the opportunity passed her by. Once she met the PNNL staff, she felt confident in her decision.

The SCGSR program creates pathways for students like Kulesa to advance their PhD thesis research while working at a DOE national laboratory, collaborating with world-class scientists, and using state-of-the-art facilities and cutting-edge scientific instrumentation.

"It's mentors like [Eric Wiedner](#), [Tom Autrey](#), [Aaron Appel](#), and [Wendy Shaw](#) who help grow the DOE [Workforce Development for Teachers and Scientists] interns and program participants," Kulesa stated. "If I am a flower, *they* are the ones who have taken the time and care to plant the seeds, tend my growth, and make sure I have everything I need to bloom. In doing so, they teach me how to grow the next garden."

Like most candidates, Kulesa had no prior national laboratory research experience. However, as soon as she reached PNNL, she took to the Lab immediately, attributing her growth on her ability to navigate the language of science.

"I've always loved science because it is like a language and that resonates with me," she shared. "There are fundamental rules and grammatical pieces of all scientific puzzles. I remember recognizing organic chemistry as a language instead of just memorizing reactions. That allowed me to speak other dialects of chemistry—including electrochemistry."

Determined to return to PNNL after completing the SCGSR program, Kulesa reached out to her previous mentors for help applying to the Pauling Fellowship so she could continue her work with PNNL's Molecular Catalysis team as part of the Catalysis Science group. Fearing she wasn't competitive enough, she was shocked at each success—even up to the job offer. With guidance and support from her mentors, she found herself again setting foot on the PNNL campus.

"I felt very comfortable returning to PNNL in a space that I was familiar with," she shared. "It's a place where my skills were a great fit and I could grow them more. It's definitely been one of the top five best decisions in my life, with the SCGSR up there as well."

From learning about ancient languages and building her laboratory experience through SCGSR, to most recently translating what electrochemistry is for a national audience, Kulesa's full-circle journey has left her with a takeaway: take the leap.

"If you're confident in your skills, don't be afraid," she stated. "Everyone at these labs wants you to **grow and be happy**. I feel a deep karmic debt to pay it forward and mentor people, and I think many folks here feel that way, too. I absolutely thrived here. The SCGSR was by far one of the most productive periods of my thesis research."

With a passion for discovery, this DOE national laboratory rising star's experience is proving that science, like language, has the power to connect, communicate, and transform our world for the better.

Watch the [National Lab Research SLAM](#). Kulesa was the third presenter in the second category.

Learn more about the [SCGSR program](#) here and apply for the program today.

