Doctoral student from UPR–Río Piedras selected for prestigious scientific research program by the U.S. Department of Energy [1]

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- Alondra S. Rodríguez-Rolón is the second Puerto Rican to receive this distinction

- Her mentor, Dr. Eduardo Nicolau, noted that this project emerged as part of her doctoral work and will contribute to lithium and water recovery to support the recovery of valuable materials in the energy supply chain

Doctoral student **Alondra S. Rodríguez-Rolón**, from the Department of Chemistry at the University of Puerto Rico, Río Piedras Campus (UPR-RRP), was selected by the **U.S. Department of Energy (DOE)** to participate in the prestigious **Office of Science Graduate Student Research (SCGSR)** program.

The DOE's SCGSR program is highly competitive and seeks to train the next generation of scientists and specialists in areas critical to energy and the environment. Its mission is to support outstanding students in conducting doctoral research in collaboration with scientists at DOE national laboratories. In this cycle, 69 graduate students from 27 states—including Puerto Rico—were selected for the first round of the call.

Rodríguez-Rolón will conduct her research at **Argonne National Laboratory (ANL)** in Illinois, under the mentorship of **Dr. Lauren Valentino**, a researcher in the Applied Materials Division within the Separations and Bioprocessing area.

"This opportunity represents a great achievement for me at a challenging time for science. It has been a dream come true! Being part of a generation of scientists committed to innovation for a more sustainable future fills me with excitement, happiness, and pride," shared the young researcher. She is also a member of the **Functionalized Materials and Membranes Laboratory** , led by **Dr. Eduardo Nicolau**, professor in the Faculty of Natural Sciences at UPR-Río Piedras and executive director of the **Molecular Center-UPR**.

"This project," she explained, "arises from the interest in separating lithium from liquid waste generated by battery recycling industries. The main challenge is achieving selective separation of lithium from other metals while ensuring the stability of the materials used."

"I am very excited to see the results of this research as part of this collaboration between Argonne National Lab and the University of Puerto Rico. I am grateful for the unconditional support of my thesis mentor, Dr. Eduardo Nicolau, Dr. Lisando Cunci, and Ámbar Maldonado-Santos, who was a recipient of this same fellowship last year."

Her mentor, Dr. Nicolau, commented that Alondra's achievement represents the spirit of excellence and scientific collaboration fostered in their laboratory. "Her research at Argonne directly complements our efforts in developing advanced membranes for water purification, resource recovery, and energy sustainability. We are very proud to see her contribute from Puerto Rico to a global-impact scientific agenda in materials and energy," he said.

For her part, Chancellor **Dr. Angélica Varona-Llavona** stated, “This distinction once again highlights not only the innate talent of students like Alondra, but also the quality of the faculty and researchers at our campus.” “I extend my heartfelt congratulations,” she added, “to student Rodríguez-Rolón and to all who have supported her academic journey, confident that this experience will be fundamental as she continues to shape a brilliant professional future.”

More about Alondra’s Research

Her stay at Argonne will extend through 2026, during which she will receive support from the DOE through a monthly stipend that will cover her expenses and provide access to the laboratory’s scientific facilities.

Her research, titled *“Exploration of Zwitterionic Ion Channel Membranes for Lithium Recovery and Long-Term Fouling Resistance in Industrial Wastewater,”* seeks to develop new polymeric membranes inspired by biological ion channels that allow for selective and sustainable recovery of lithium from industrial streams. This work contributes to advancing technologies for the recovery of critical materials and the development of a clean energy supply chain.

Lithium recovery, like that of other metals, is increasingly important due to current demand in electric vehicles, electronic devices, and other technologies that rely on lithium. The DOE is interested in exploring strategies to recover this critical material from uncommon or unconventional sources, such as industrial wastewater. “That is why, together with Dr. Valentino, we will investigate membranes that mimic selective ion channels for lithium transport and that also demonstrate resistance to fouling,” explained the future Ph.D. in Analytical Chemistry.

Rodríguez-Rolón’s project aligns with the DOE’s mission to strengthen the supply chain of critical materials such as lithium and incorporates techniques such as **X-ray photoelectron spectroscopy (XPS)**, **thermogravimetric analysis (TGA)**, and **scanning electron microscopy (SEM)** to correlate the chemical structure of materials with their selective performance and fouling resistance.

How to Apply to the Program

Link of interest: *SCGSR How to Apply | U.S. DOE Office of Science (SC)*
