



## PROFILES IN SCIENCE ENGAGEMENT WITH FAITH COMMUNITIES

# Mónica FELIÚ-MÓJER

*Dr. Mónica Feliú-Mójer is Director of Communications & Science Outreach at Ciencia Puerto Rico, Director of Diversity & Communication Training at iBiology, and a Producer with Wonder Collaborative. We spoke with her about teaching science by using relevant cultural context and what to think about when working with communities. (Above photo courtesy M. Feliú-Mójer.)*

### **What was your journey to professional science and science communication?**

I was born and raised in a rural, working-class community in Puerto Rico. I grew up with lots of animals, surrounded by nature and living things, so I was really interested in biology.

Like many people with my type of background, I didn't know that I could be a scientist because I didn't know anyone with a career in science. Looking back, I realize that I was, in fact, surrounded by scientists; they just hadn't pursued it as a professional career. Scientists I saw in school or the media didn't look like me, didn't sound like me. Science as a career never seemed like a possibility, and it was something that felt foreign and distant from my reality.

When I was in high school, I thought I would end up in medicine because that was the only biology-related career that I knew was possible. Then when I got to college, I met my first professional scientist—a woman, Puerto Rican scientist. She opened my eyes and encouraged me to pursue my first research opportunity. After that, I was like, "I don't want to do medicine; I hate hospitals anyway. I want to do science. I can discover things nobody has ever seen!" That really blew my mind.

I did research as an undergrad, then left Puerto Rico and moved to Boston. I wanted to get a Ph.D., and I was often told that I should leave because it was so hard to do science in Puerto Rico—there were not a lot of resources and it was very bureaucratic. I left because I wanted to come back—I wanted to train at some of the best universities in the world, learn all of the things, meet all of the people, and then come back to make science in Puerto Rico better.

In Boston, I worked as a lab technician before grad school. I realized that coming back to Puerto Rico would take more than a decade, with getting a Ph.D and doing a postdoc. Within a year of moving, though, I started feeling like I couldn't wait that long. I had a bit of an identity crisis, because so much of my identity as a scientist was being a Puerto Rican scientist who wanted to connect to my community and give back, and I wasn't able to do that. Plus, there was the culture shock of moving to Boston: speaking a language that wasn't my first language, the weather, the culture. The lab that I worked in as a technician was bigger than the whole department where I was an undergraduate researcher.

I felt like I needed to either be Puerto Rican or a scientist—I couldn't be both. But, as I was interviewing for grad school in 2006, I met Daniel Colón-Ramos, who is now a professor at Yale. He and a colleague had just launched Ciencia Puerto Rico, a website for people interested in science and Puerto Rico, with the goal of creating opportunities to give back to Puerto Rico. And it was exactly what I'd been looking for!

The first project I volunteered on was a collaboration between Ciencia Puerto Rico and *El Nuevo Día*, the newspaper of record in Puerto Rico. We connect scientists with

the newspaper, and they then write popular science articles with the idea of making science accessible and connecting it with the culture and context of the paper's readers.

That's how I got started in science communication; I love telling stories and I love science, and I realized that I could tell stories about science. Science communication allowed me to resolve my identity crisis—it helped me realize that I could bring my whole self into science and that I could connect it with my culture and my identities, and that that was okay. That has been the foundation of everything I do.

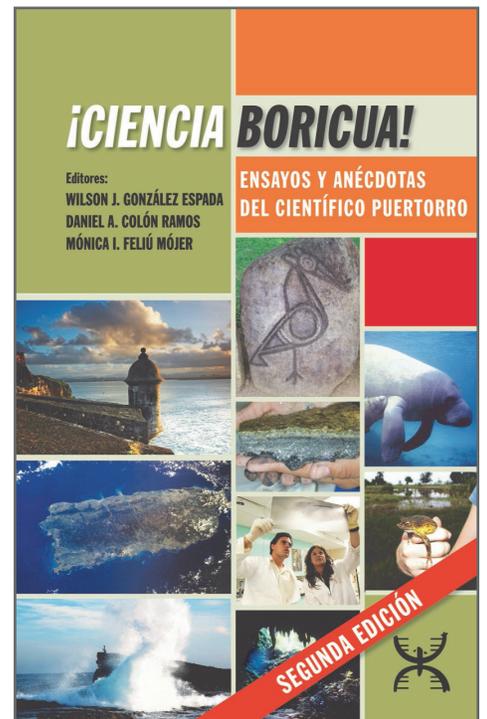
**How did your work in science communication grow from that first project?**

We started the collaboration with the newspaper in 2006, and I started writing and editing for the paper and also helping other scientists do the same thing. We began hearing from students, teachers, and parents saying, "We saw this article and we're using it in the classroom." In Puerto Rico, science education is not particularly contextualized to the culture and the reality of students, and so people started using our articles for that.

At that time, we had a volunteer who is an expert in multicultural science education. He suggested that we publish a book with some of our best and most popular articles, as well as some new ones. We worked on it for two years, and the book came out in 2011. It's been used in schools, we've used it to test contextualizing science in the classroom, and many of the articles are still very relevant. And something happened after the book's publication that made me realize that what we were doing was special.

In Puerto Rico, there is a nonprofit that directs the Montessori schools in the public school system. We collaborated with them to use the book in their classrooms and test its impact. One Friday, the director of the institute sent us an email. The students were off that day because of a faculty retreat, but the director said that she was walking across the yard and saw a group of students sitting underneath a big tree. Curious, she approached them and asked what they were doing. They had come to the school to read our book from the library.

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*Ciencia Puerto Rico's collaboration with El Nuevo Día resulted in many popular science articles, some of which were later collected in a book, iCiencia Boricua!*

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That was when it hit me that we could really have an impact. We could go beyond connecting people with science and telling stories that make people feel proud. I realized that there was a potential for real change with our approach.

**What does it mean for science to be culturally contextualized?**

It's connecting scientific concepts to the lives of people, to the things that they know, their values, their beliefs, their emotions. Research suggests that when you connect science to people's culture, they learn science better, because then it matters to them. One of my favorite examples of this is to take a universal biological concept like seed dispersion: plants use the shape of their seeds to make sure that they go as far as possible and create new baby plants and trees.

If you are in the Northeastern U.S., you might have seen the seedpod of a maple tree. It's like the blades of a helicopter, and when that seed falls, it swirls around in the air and so flies far. But if you tell a kid in Puerto Rico, "We're going to learn about seed dispersion from the maple tree," sure it's a neat example, but it's far removed from their reality because we don't have maple trees in Puerto Rico. But we do have hundreds of types of trees that do the same thing, so we can easily make the concept relevant.

For example, the African tulip tree is everywhere in Puerto Rico. There are hundreds, maybe thousands, of seeds in a pod, and when the pod opens, the seed has a heart shape and is surrounded by a thin transparent membrane. The pods usually open in summer, and the seeds start flying out and you see them floating in the hot, humid summer wind. I grew up in a very rural place, and I remember sitting on my balcony in the summer and just seeing them fly and land everywhere. Using the African tulip tree connects this universal scientific concept to the reality of the people.

**Could this idea apply even beyond life sciences?**

Absolutely. In that book we published, there's an article by a geologist answering the question, "Is Puerto Rico the tip of a volcano?" In Puerto Rico, people popularly talk about it having volcanic origins. The geologist uses that idea, something that a lot of people think might be true, to explain the geology of Puerto Rico. And he says, "No, we're not the

tip of the volcano," but he connects geology concepts to this popular misconception.

**How should scientists and science communicators who want to serve their community ensure that they are being useful?**

I always think about it as, "How do I put what I know and the resources that I have at your service?" That means respect, listening, and not judging. It means understanding how these communities work and who are the trusted messengers. You as a scientist are not always the right messenger, and so you should look at who the trusted messengers are that you can meaningfully partner with. And I emphasize "meaningfully partner," because it's not just, "Hey, let's collaborate so I can get access to this community, so that I can do what we think we should do." It's about an equitable partnership with the trusted messengers, so scientists can engage with the communities.

From the beginning of a relationship, approach it with humility and with the intent to serve the community. Have an understanding that we might live different realities and know different things, but as a community, you know what you need and you have science knowledge, even if you don't call it that. Understand and respect that the definition of science is not just what Western and White academia says.

Come to the community relationship with empathy. Be there to listen, and have an understanding that this relationship goes both ways. Just because you might know more about science doesn't mean that you're above them and get to dictate what they do. The history of their communities also has an impact. I always emphasize "Look at the history of this community with science."

The thing that is most important is that science and data and facts are not enough, which is very hard for scientists to understand. Internalizing this is important. People's values, emotions, beliefs, life experiences, identities, and culture all influence how they value, understand, and perceive science.

**Can you give us an example of the relationship with the community going both ways?**

I'm learning a lot from this work, too. We're working on a COVID resource project, and we were intentional about trying to connect

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with as many communities and leaders as possible that serve different marginalized groups in Puerto Rico. We wanted to reach disabled communities because we know that they are very marginalized within the marginalized. And so, we've recently started working with the deaf community in Puerto Rico. We connected with an American Sign Language (ASL) interpreter who's been working with the deaf community for more than 30 years.

We planned to have a community forum, but first, my teammate and I sat down with the interpreter and asked all of the questions we had. Some of them felt like stupid questions, but I hadn't worked with the deaf community, and I would rather feel stupid and ask, than not know. For example, I didn't know that deaf people speak ASL in Puerto Rico and in the U.S. and Canada, so it doesn't matter whether I'm speaking to the interpreter in Spanish or in English. We learned so much from just talking to the interpreter, because she's not only very knowledgeable, but she is a trusted messenger within this community. People came to the forum because she invited them. And that could be done with any community or organizational leader.

**How has faith been an element of your engagement?**

People's beliefs, including religious beliefs, impact how they understand, value, and engage with science. In that sense, it's been ever present. I don't engage specifically with religious communities a lot, but in Puerto Rico, we're a pretty religious, socially conservative country, and Christianity is the predominant faith. Even if you're not religious, religion has a very strong cultural presence. "God bless you" is a greeting that's very common in families. Even people who aren't believers will

say, "Oh, my God" or "God bless you" a lot, because culturally, it is a part of who we are. In Puerto Rico, religion transcends whether or not people are believers.

Daniel, the founder of Ciencia Puerto Rico, went to Catholic school and has a good relationship with the Catholic community in Puerto Rico. During the pandemic, he had a Zoom meeting with about a hundred priests because they were concerned about what COVID-19 meant for their ability to get together, and wanted to know how to serve their communities.

Religious or faith-based groups and communities often provide relief and a safe place. They are a place of gathering. In religious communities, often the pastor, priest, leader, or group leaders are the trusted messengers. Religious leaders might be important partners for the work that you do. Work to understand how to help them, and understand that you're working together.

**How do you navigate the challenge of a lot of science resources being only or primarily in English?**

In Puerto Rico, English is an official language, but most people do not speak it fluently. However, English has become the de facto language of science. Some people already feel science is inaccessible, and on top of that, you are going to tell them about it in a language they aren't comfortable in? That imposes barriers that affect innovation and access to knowledge because if people don't speak the language, they don't have the privilege of accessing certain spaces.

Beyond language, cultural relevance of resources is important, too. Yes, resources should use a language you understand, but

they should also tell you about it in a way you will understand—using your everyday words to connect scientific concepts to the way you already understand the world.

With Ciencia Puerto Rico, one of our goals is to foster critical thinking, to give people the tools of science, so they can use them to solve the problems they have. Not everyone will be a scientist, but everybody has problems. Connecting people to science isn't our end goal; it's about the skills that we want to foster in people, and the agency that we want them to build through science engagement.

**Are there resources you recommend that are about having humility and listening to people?**

Inclusive Science Communication published a landscape study in 2020 where they took a deep dive into what inclusive communication looks like. Full disclosure, I'm on their Conference Planning and Strategic Committees. There are a lot of resources on their website and a lot of examples of really innovative communication that centers equity and inclusion. ~

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For more DoSER resources, including more about Dr. Feliú-Mójer, please visit:

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A still image from a video in "Aquí Nos Cuidamos," a collection of culturally relevant, Spanish-language, multimedia educational resources to help Puerto Ricans stay safe from COVID-19.

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