

LET'S TALK SCICOMM

BY IAN DEMSKY



L-R: Yukiko Yamashita, Sarah Kearns, Attabey Rodriguez Benitez, Elizabeth Ronan, Vikramjit Lahiri

Lesia Thompson Photography

When the zombie apocalypse comes, chemist Raychelle Burks, Ph.D., is going to camouflage herself with death-scented cologne. It will be made using two natural polyamines — aptly named putrescine and cadaverine. She may even save the rest of us if her plan to mass produce this *eau de death* using *E. Coli* bacteria pans out.

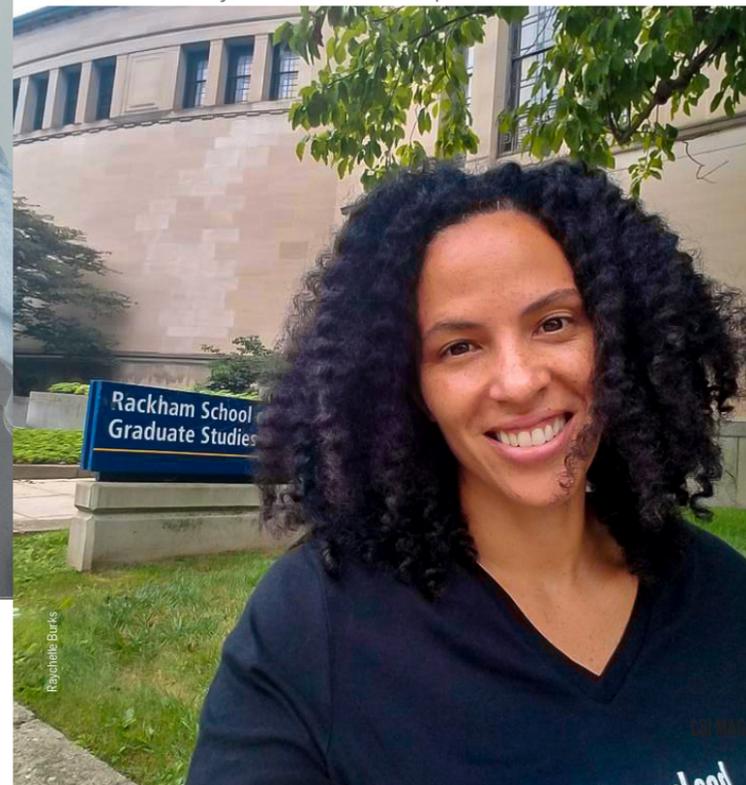
And if the undead hordes fail to rise, she will still have accomplished her goal of inspiring vibrant scientific discussion using pop culture as a jumping off point.

Burks delivered the keynote for ComSciCon-Michigan 2018, a graduate-student-organized science communications conference held at the University of Michigan's Ann Arbor campus last summer, and she is among a growing vanguard of researchers who believe that serious science and engaging communications don't have to be mutually exclusive.

"Pop culture and sci-fi are great mediums for talking about science in a way that allows everyone to participate," says Burks, an assistant professor of chemistry at St. Edward's University in Austin, Texas. "You can throw a theory out there and see what other people think based on the literature at hand — and that should sound very familiar to scientists."

Helping to organize events like ComSciCon is just one way trainees and faculty at the University of Michigan Life Sciences Institute are engaged in outreach. Others include participating

Raychelle Burks on U-M campus.



Raychelle Burks

in campus science communications interest groups (often shorthand as SciComm), meeting with federal lawmakers, giving media interviews, maintaining vibrant social media channels and visiting elementary school classrooms — to give just a few examples.

Collectively, these activities exemplify the type of public engagement encouraged by U-M President Mark Schlissel in his push to increase knowledge-sharing beyond the university.

And as scientific consensus comes increasingly under fire — with attacks on areas like anthropogenic climate change, vaccine safety and evolution — there are many who believe scientists have a responsibility to step up their communications game.

Roger Cone, Ph.D., vice provost and director of U-M's Biosciences Initiative and director of the LSI, puts it this way, "Part of our job as scientists is to help the public understand the value of the investment they've made both in public universities like U-M and in federal institutions like the National Institutes of Health."

RULES OF ENGAGEMENT

Public engagement by scientists is having something of a moment. Not only has there been a burgeoning of SciComm-themed conferences and workshops in recent years, but a changing political landscape has also galvanized many scientists toward increased public outreach and activism.

The March for Science in April 2017, for example, drew more than 1 million participants across the globe in an unusually unified and vocal pushback against attacks on evidence-based policymaking and threats to drastically slash funding for research.

"I strongly disagree with the idea that, by reaching out to the public to talk about my work and to talk about how science affects their everyday lives, I am somehow not able to be objective in my science," says Meghan Duffy, Ph.D., a U-M disease ecologist who spoke at the march in Washington, D.C.

Last fall, Elizabeth Ronan, a doctoral candidate in the U-M Medical School's Department of Molecular and Integrative Physiology, participated in the American Physiological Society's "Hill Day," visiting with lawmakers in Washington, D.C., to discuss the importance of support for academic research. Ronan's group, which included U-M physiology professor Daniel Michele, Ph.D., met with staff members from several Republican and Democratic members of Congress.

“We went on behalf of the APS, but also as individual constituents from each of our respective districts,” says Ronan, who studies sensory biology in the lab of LSI faculty member Shawn Xu, Ph.D. “The staffers seemed very appreciative that we were there to offer a scientist’s perspective. It was clear that scientists don’t meet with them nearly as often as other advocacy groups.”

The Michigan group, for example, met with staff from the office of former Rep. Mike Bishop, a Republican from Michigan’s 8th congressional district, who co-sponsored a bill aimed at ending U.S. Department of Agriculture research into toxoplasmosis that uses cats, a primary carrier of the *Toxoplasma gondii* parasite. Toxoplasmosis can cause serious health issues for pregnant women and individuals with compromised immune systems.

“We emphasized that scientists give thoughtful consideration to determine the best model for each question,” explains Ronan, who is also enrolled in the Science, Technology, and Public Policy Certificate Program at U-M’s Gerald R. Ford School of Public Policy. “I use the model *C. elegans* — a tiny roundworm — which is an ideal organism for studying the mechanisms of sensation. My master’s thesis was in a tissue engineering lab using sheep as a model for ACL repair, because their knees are surprisingly similar to humans. We wanted them to understand that scientists having access to the right model is really important for scientific progress.”

And even if the researchers didn’t change the lawmakers’ minds on specific issues, Ronan says she feels like they were able to help ensure perspectives from the scientific community were at least considered, and they encouraged the lawmakers to contact them in the future about scientific issues.

Graduate student Sarah Kearns, who chaired the ComSciCon-Michigan organizing committee, points out that the conference came together against a backdrop of several public policy challenges involving complex, scientific issues — including the water crisis in Flint and the spread of harmful chemicals known as PFAS through the state’s waterways.

“Policy isn’t made in the lab,” says Kearns. “We need to clearly communicate about the science involved — to the people who are affected by these issues, to voters and to the legislators making decisions about them.” (The conference, a satellite of a national event started at Harvard in 2013, was sponsored by departments and units at U-M and Michigan State University, including the LSI, and drew participants from across the region.)

Polling data show that scientists have an uphill battle, notes



Elizabeth Ronan & Daniel Michele on Capitol Hill

Mary Woolley, president of Research!America, a leading science advocacy group.

Only about 15 percent of the public can name a living scientist, the group has found. And two-thirds can’t name a single place where research occurs.

“They don’t say ‘the University of Michigan’ or ‘the university of my state.’ They say, ‘I don’t know,’” Woolley says. “So, it’s critical that the science community overcomes its invisibility.”

Politicians aren’t hearing enough from constituents about the importance of science or of funding research — which can have real-world consequences for human health, for regional economic prosperity and for developing future scientific leaders, she adds.

The day President Schlissel announced his new effort to boost public engagement by U-M faculty during his annual Leadership Breakfast in 2017, Woolley was on campus giving a SciComm seminar: “Your Role in Shaping Hearts and Minds for Research.”

“I was thrilled to hear about it and often mention it as a model when I’m visiting other campuses,” Woolley says. “Kudos to the University of Michigan and your leadership.”

Schlissel’s initiative includes adding new tools and resources

to support public engagement at U-M, peer mentoring by successful faculty, and hiring a communications manager for public engagement. The U-M Provost’s Office, too, has been working with deans, chairs and faculty on incentivizing and counting various types of public engagement in annual reviews.

SOCIAL BUTTERFLIES

Meanwhile, there’s no question that social media in particular has opened new frontiers for science communication. Use of social media grew from 5 percent of U.S. adults in 2005 to nearly 70 percent last year, according to the Pew Research Center. So it should be no surprise that social channels have become an increasingly critical tool for disseminating research findings, networking and keeping up with developments in one’s discipline, not to mention inspiring the next generation of scientists.

“There’s a lot of great science that deserves to be shared beyond just what grabs the biggest headlines,” says Kearns (@annotated_sci), a member of the MiSciWriters student group, who is co-mentored by Michael Cianfrocco, Ph.D., at the LSI and Kristen Verhey, Ph.D., in the Medical School. “Microscopes are really cool and telescopes are really cool — and that pure, raw curiosity about the universe should be cultivated more in our society.”

“THERE’S A LOT OF GREAT SCIENCE THAT DESERVES TO BE SHARED BEYOND JUST WHAT GRABS THE BIGGEST HEADLINES”

And social media prowess isn’t limited to the realm of students. Some senior faculty are already out in front of their Millennial and Gen Z trainees. Developmental biologist Yukiko Yamashita, Ph.D. (@yamashitafllylab), a Howard Hughes Medical Institute investigator and professor at the U-M Medical School and Life Sciences Institute, has more than 1,000 followers on Twitter.

Her feed blends scientific musings — *What I keep learning (meaning, I haven’t learned enough) is that the most important thing in science is to have [the] courage to always do the next right thing, no matter how other things may look faster, easier or more promising.* — with slices of her personal life — I was

about 10 years old when I had banana chips for the first time, and I thought “wow this is the best food I’ve ever eaten. What have I been missing for my entire life!?” Since then they’re still my favorite snack.

Yamashita started using Twitter as a time-saver for keeping up with particular journals and labs, but soon discovered its broader utility. It’s now a mainstay for following the careers of peers and former trainees, and for sharing ideas.

“It’s also great opportunity to get to see scientists’ personal side,” she says. “It can give younger people a view of what a scientist’s life is really like.”

FINDING THEIR VOICES

Twitter is a “great equalizer,” says Oleta Johnson, Ph.D. (@oletaknowstuff), a recent graduate of the U-M Program in Chemical Biology who is currently pursuing a postdoc at the University of California, San Francisco. “You can have a Laura Keissling or a Carolyn Bertozzi tweeting at an undergrad or a grad student. It makes you feel like you belong to the community of scientists that you admire.”

When Johnson defended her thesis last August, congratulations poured in, including from faculty members at Emory and the University of Chicago whom she had met months earlier at the Bioorganic Chemistry Gordon Research Conference.

“For me, Twitter has been a great tool for building and maintaining professional networks,” she says. “Instead of asking for your business card, these days it’s ‘Are you on Twitter?’”

Johnson joined Twitter as an undergrad “to keep up with jokes,” and has since developed a presence that champions issues of minority representation in science and social justice causes. At the time of her interview, Johnson had sent nearly 29,000 Tweets — roughly the equivalent of War and Peace.

On the other end of the spectrum are those who are just getting started. Vikramjit Lahiri, a graduate student in U-M’s Molecular, Cellular and Developmental Biology Department, also tiptoed into the Twitterverse last summer.

“My table at #ComSciConMI18 made me sign up for Twitter,” his first Tweet announced. In the accompanying selfie, an almost smiling Lahiri is ringed by six beaming fellow trainees.

“I’m still testing the waters,” Lahiri (@LahiriVikramjit) admits a few months later.

Lahiri's interest in developing his SciComm chops was sparked by his mentor, LSI faculty member Daniel Klionsky, Ph.D. Not only is Klionsky a journal editor and prolific scientific author, he's used dance, music and sculpture to explore aspects of his research focus, the cellular recycling process known as autophagy. Last March, Klionsky and Lahiri co-authored an article for *The Scientist* titled, "Eat Yourself to Live: Autophagy's Role in Health and Disease."

"It took two to three months to write what I thought was a very, very transparent draft," Lahiri says. "Then the editor came back and said the second half is good, but the first half is too dense — the part on the mechanics and basic biology. We went through several rounds of revisions, which was pretty frustrating, but in the end I feel that all those changes made it a lot more accessible. That's how I got interested in really studying how you can convey your message in a simpler manner."

Others set up their own broadcast channels. Attabey Rodríguez Benítez (@AttabeyR), a Program in Chemical Biology student and member of the Narayan and Smith labs at the LSI, runs a blog called "Arroz y Habichuelas," which explores scientific topics in both Spanish and English, ranging from plastic-degrading microbes to fecal transplants.

Hailing from Puerto Rico, Rodríguez Benítez grew up caught between two worlds. "Our science classes were in Spanish, but our textbooks were in English," she says. "The tests were in Spanish, the important conferences and journal articles were in English."

Her blog is an attempt to negotiate that cultural divide and to contribute to the availability of approachable, accurate science

Oleta Johnson celebrates her thesis defense.



LSI MAGAZINE / SPRING 2019

stories in her native tongue. But translating science for general audiences — in any language — is an important challenge on its own, she notes.

"When there's too much jargon, only scientists can understand it," says Rodríguez Benítez, who also served as an organizer of ComSciCon-Michigan. "We need to make science more accessible if we want people to understand how it's important to their lives."

#MINORITYANDSTEM

For several months, Johnson has had one of her own tweets pinned to the top of her Twitter feed.

"Existing as a black woman in STEM is inherently a socio-political statement, and not by MY choice," Johnson wrote, amplifying a tweet by #BLACKandSTEM creator Stephani Page, Ph.D. "Trying to make MY working conditions better is not some extracurricular activity. It's my survival."

The exchange is emblematic of Twitter's frequent use as a tool to elevate underrepresented voices within the sciences, to build communities of experience among researchers who may feel isolated within their labs or institutions, and to draw attention to systemic and structural disparities in academia.

This mirror can be uncomfortable for those on the receiving end. Organizers of an event may draw questions if the speaker lineup is strikingly homogenous.

"There are diverse voices out there, so the question is not 'Is



Elizabeth Ronan & Attabey Rodríguez Benítez

there a diversity problem,' the question is 'Is there an inclusion problem,'" says Burks, the ComSciCon-Michigan headliner. "Social media has really shined a light on academia in a way that's almost like real-time streaming. I love the Panda Cam and the Eagle Cam — and this like a real, live Academia Cam."

The breadth of voices and experiences available on social media can offer perspective's beyond one's usual orbit, adds Burks (@DrRubidium), whose popular Twitter feed has nearly 18,000 followers.

"There are a lot of scientists who are saying now is a critical time to speak up," she says. "But if you're a black scientist, a Latinx scientist, an Indigenous scientist, you're saying, 'For my community, it was a critical time before 2016, it was a critical time in 1916, it was a critical time in 1816.' One of the great things about social media is that it has shifted what gets seen and who gets seen. And that's really exciting because across professions and genres you're hearing voices and seeing work that wasn't getting highlighted before."

Johnson, who served as a graduate student representative on the LSI's diversity committee, adds that faculty and administrators would be well served to pay attention to the experiences of trainees that are being shared on social media, women and minorities in particular.

"You can read a thread from somebody that's in same shoes as someone in your lab, someone in your program, and have a whole different understanding and empathy level for the things they're going through that you might have never experienced," she says. 🌐

RAYCHELLE BURKS' SCICOMM ADVICE FOR BEGINNERS

- SciComm is not one size fits all. It depends on your discipline, on who you are and you're interested in, on what you want to do and why you want to do it.
- There are tons of small and big ways to make an impact — and you don't need to do them all. What best highlights your work? What is the easiest for you to do? Pick something you enjoy, that's easy and budget friendly.
- Ease of use is important and it shouldn't be minimized, especially when you're at a stage in your career when you have a lot of other things going on. (For me, binging on sci-fi and talking about the science of sci-fi are a 2-for-1. You do you!)
- Pick one thing to start with and see how it goes! You have the freedom to drop it. You have the freedom to expand. Experiment with it, just like you would with parameters in a research project.

JOIN THE CONVERSATION

@UMLifeSciences

publicengagement.umich.edu