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CAROLINE BARTMAN: I think it is critical for scientists to communicate with the public, and I think that's becoming clear in this pandemic, you know, because all of a sudden everyone kind of has to be an expert in antibodies and in viruses.

HOST: Hello everyone, and welcome to "We Roar." As the COVID-19 pandemic goes on, we're contacting more students, faculty, staff and alumni to hear how Princetonians are living and working through the crisis, to hear how we're staying connected from afar, and how so many of us are working to serve the wider world.

In this episode, we connect with an early career specialist in viruses. Her recent op-ed piece in the Washington Post brought important knowledge about coronavirus infections to the public's attention.

CAROLINE BARTMAN: I'm Caroline Bartman. I'm a post-doctoral research fellow in the Joshua Rabinowitz Lab studying whole-body metabolism. So in fact, I got interested in virology because my very first research experience was actually in Tony Fauci's lab studying HIV. And so I've sort of continued that throughout my research career.

Dr. Fauci is fantastic, and I think this is, like, really his calling — is, sort of, interfacing between scientists and politicians and the public on trying to help solve these public health challenges. And it's reassuring to see him, you know, at all the press briefings, because I know that he has a deep understanding of the science, but he also has that, like, interpersonal skill where he is able to give these recommendations and hopefully persuade officials that this is the right thing to do from a public health standpoint.

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Right now in the Rabinowitz Lab, one of my projects is understanding how infection changes nutrient use in different organs. In the first lab meeting — when we were talking about shutting down the lab and how we were going to be productive, you know, working from home not doing experiments in the lab — my boss, Dr. Rabinowitz, and I both thought that the issue of a higher viral dose leading to a higher risk of infection was something that scientists were thinking about, but the public didn't have in mind.

And we were discussing this, and we sort of saw a disconnect, I think, because people who had worked with viruses previously know this concept of viral load well. However, we didn't see, you know, lay people who were discussing this pandemic in the news, or policymakers, weren't thinking of this concept.

And so we thought that we should raise it. The challenging thing about this pandemic is that people have to make decisions very fast based on limited amounts of information. And as scientists, that's very frustrating and hard, but at the same time, we wanted to share this idea that viral load could be important so that policymakers could at least have it in mind.

So the idea of this concept of viral load is that when a person is exposed to virus in their daily life, it can be a single viral particle, but most likely it's multiple viral particles — so 10 or 100 — that an infected person either is breathing out or left in their environment. And when you get exposed to a virus, the more particles of virus you're exposed to, the higher your risk of becoming infected.

A metaphor we used to describe this idea of viral dose in the op-ed was a poison. The more poison you're exposed to, the more harmful it is. And in terms of policy, we think that's important in a couple different respects.

The first one is that the, really, highest-dose environment for this virus is going to be the health care setting, because health care workers are around patients that are very sick, that have high levels of virus. So as a society, we wanted to emphasize that we need to make sure those health care workers have the appropriate protection.

Of course, everyone's saying this, but we wanted to emphasize that that can really stop the spread of a lot of these high-dose exposures. Then the second reason that this dose issue is very important is we're going to have to start going back to work and opening up workplaces. And in that context, where people are encountering each other and are together in the workplace, we want to do that in a thoughtful way that minimizes these high-dose exposures — so things like cleaning surfaces very often, and maintaining social distancing even when you are in the workplace, and maybe even working in shifts.

Those things will mean that, you know, maybe if you are exposed to virus, it will tend to be these lower doses of virus that will be less likely to infect you.

It's a great question whether a milder infection, a lower dose, leads to less strong immunity. And I think studies are quickly coming out, and we'll know in a month or two whether that's the case.

Something I will say that's very promising is that a couple of studies are coming out — for example, of 150 people in China — and they saw that actually 95% of patients made an immune response to the virus, and that included some patients that had pretty mild disease. So I'm optimistic that everyone will have some immune response. It is possible that people with more severe disease maybe have a stronger immune response, but we'll really have to wait and see on that.

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It's really exciting to see all the amazing research that is moving so quickly. And in fact, all of these coronavirus experts who, you know, didn't get so much funding because people said, “You're just studying the common cold!” — I mean, those people — you can see that their years of expertise are coming to the fore. And hopefully they're working, you know, like, whatever — 16 hours a day now, seven days a week. And

hopefully that expertise and that hard work is really going to pay off in terms of drugs that may eventually help reduce viral symptoms when you get to the hospital, and then in terms of vaccine development as well.

There are a lot of exciting things on the scientific research side. I think something that one scientist has raised is the idea of having a vaccine that doesn't treat just this particular virus, but could potentially treat all coronaviruses, because, you know, the common cold coronavirus, SARS, and now this COVID-19 have many things in common, and they only have a few changes.

So it's conceivable that you could eventually design a vaccine that targets that whole family of viruses, and that would be kind of like a holy grail that, you know, if there were to be a SARS-CoV 3, maybe this vaccine could address that as well. I mean, this is, I would say, more of a long-term goal. Right now we're developing vaccines that hopefully will be ready in a couple years, and that would be for this virus specifically. But going forward, it would be very cool to have a vaccine that addresses all coronaviruses.

I think it is critical for scientists to communicate with the public, and I think that's becoming clear in this pandemic, you know, because all of a sudden everyone kind of has to be an expert in antibodies and in viruses. And I do think, as scientists, it's definitely a challenge. We're trained to talk in a way that's convenient for other scientists.

And, you know, starting from a baseline that we all have some sort of basis of common knowledge, and we talk in this jargon that our other scientist friends understand, we have to change that way of communication, or add to that more facility with communicating with people who aren't scientists but need to know this information.

And, I mean, it was definitely a challenge in the op-ed, and it was a great learning experience for me in trying to simplify to, you know, I have this, like, deep, complicated information about these viruses from reading all of these historic papers. How can I distill that down to the information that someone would actually want to know, you know? The person reading my op-ed does not want to be an expert on the virus. They want to know, how does this information affect my daily life?

And so I think that gaining those skills of distilling down information and communicating that to the public was something that I really want to learn to do better, and this was a great learning experience. And I do think that, you know, scientists in general should sort of take that challenge.

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