# Through the Lens of a Scientist: Interview with Caitlin Warlick Short, M.S.

**Ellie:** [00:00:00] Hi everyone. I'm Ellie. Today , we will be interviewing Caitlin Warlick-Short, currently the Director of Communications at the National Science Policy Network. Caitlin received her graduate degree from the University of Wisconsin, Madison, where she investigated the molecular mechanisms, underlying growth cone dynamics and axon guidance in brain development. Caitlin and I were members of neighboring labs in the department of neuroscience at UW Madison, which was my Alma mater. And so her lab had the spectrophotometer that a lot of labs on the floor used. And so I always ran into her when measuring the concentration of my DNA. Caitlin, it's lovely to have you on Politics Under the Microscope. Could you tell us a little bit about yourself?

**Caitlin:** [00:00:36] Yeah, thank you, Ellie, for that really kind introduction. As you said, right now, I'm serving as the Director of Communications for the National Science Policy Network. But I thought before I really talk about what I'm doing, it might be helpful to explain a little bit how I got here and my background and my interest in science fundamentally. And then also, we'll talk about how that fits into policy [00:01:00] eventually.

[00:01:01] Like a lot of other scientists I found from a very early age that I was really fascinated by the natural world. Both of my parents are artists. My mom is an art teacher. Um, very much encouraged me to observe and document the world through drawing. Of course, as I got into high school, I was able to explore a little bit more academically and was really lucky to have an incredible experiential learning Marine Biology course, where we loaded 50 kids onto a charter bus and drove all the way from Indiana down to the Florida Keys. And, probably the most influential was, several chemistry classes with a really inspiring teacher. So, that led me to pursue Chemistry in college. I went to a small liberal arts college in Iowa called Grinnell College.

[00:01:52] And when I was there, I honestly really stumbled across neuroscience, mostly by accident. While I [00:02:00] loved chemistry, I will admit that physics was not my favorite subject. And so, I heard about this class from a friend of mine and just was instantly fascinated and, entranced by the connection of the brain, the body thinking about what's happening at the cellular level and how that really gives rise to a lot of things that we still don't understand, like consciousness and memory.

[00:02:27] Ultimately, that was the place that I began to develop this passion about this interconnectedness and thinking about ethics and philosophy and, a lot of interdisciplinary questions , which I think has also led me to feel very at home and excited in the intersecting world of science and policy. And also giving rise to some of my other interests in community and network development and thinking about how all of these different spaces, academies, [00:03:00] and sectors, non-profits really fit together and need to work together with communities to actually bring about change and important impacts for everyone's daily lives. They're all interconnected, even though, even though we often sit in our sort of siloed worlds and think mostly about the people that we interact with on a day to day.

**Naira Abou-Ghali:** [00:03:22] Here, Caitlin points out a major lesson she learned from her early science education, which is that everything is interconnected. Next we ask her about

her graduate research and how it informed her work in science policy and shaped her understanding of the world.

**Ellie:** [00:03:39] So could you tell us a little bit about your scientific background and your training?

**Caitlin:** [00:03:44] So from my undergraduate degree in Chemistry and then a concentration in Neuroscience, I went on to spend a few years working at the University of Colorado in Boulder, and got a lot more neuroscience experience there, which was really fantastic. And then that [00:04:00] led me back to the Midwest and the University of Wisconsin Madison. And so I worked in the laboratory of Dr. Timothy Gomez studying the mechanisms of axon guidance. So for those of you who are not necessarily in the neuroscience world, all neurons have an axon and a dendrite that they use to send signals throughout your body. And so some of these can be as long as a meter from your brain down to your lower back. During development, we all began as a single cell and those have to make these very complex structures. In our lab, we were really interested in how they do that and how do they do that in a very consistent pattern, such that my nervous system and your nervous system essentially look very similar. That requires a mechanical process or change in the cell. We [00:05:00] study how that happens in relationship with the environment. Within an individual cell, you have proteins that make up what we call the cytoskeleton that gives it its shape, and those can be moved and changed very dynamically and in response to signals from the other tissues or things that are around them.

[00:05:20] I was really interested in how this works, specifically around these neurons that we're developing that would have to go from one kind of environment to a very different environment, across a barrier or a wall. And so I looked at how the end of the axon in the growth cone actually would strategically release proteins like scissors or shears to create space to forge through to this new environment.

**Naira Abou-Ghali:** [00:05:49] So far Caitlin tells us about her journey as a scientist, where she studied the forces at play in axon growth and dynamics. I always like to consider how scientists can [00:06:00] take themes from their very specific work and apply them to other areas. As a scientist Caitlin's job was to understand how brain cells form connections by studying axon growth. Today, she's working to build an understand how networks of people can be used to make new policies and solve large scale problems. Everything is connected! Let's hear more about Caitlin's work at the NSPN.

**Ellie:** [00:06:23] Could you tell us in our listeners exactly what you do for the NSPN. What is your job? What are your responsibilities, for example?

**Caitlin:** [00:06:31] I'll start with explaining a little bit for those who are unfamiliar, what the National Science Policy Network is. We're a consortium of early career scientists and engineers all across the country who are really committed to the inclusion of scientific evidence in the policy making process.

[00:06:49]And we believe that that's really important for us to better power a diverse, equitable society and a sustainable and resilient planet, and that science is a really important piece [00:07:00] in that process, both for evaluating what's working and not working. And then also for helping us identify new ways to do things better, whether that's technology for energy resources, or all kinds of other things. And so our mission is to do this by

empowering these early career scientists and engineers, to engage in the process at all levels: locally, state, and also federally, by building community. A lot of these scientists don't necessarily have a lot of other people around them who are doing these things. By providing and connecting our members with training opportunities so that they can learn more about the policy process and how to better engage or share their science, where it makes sense. And then finally, by creating new opportunities and support often financial as well as other pathways to encourage them to go forth and do that work.

[00:07:57]So my role at the [00:08:00] National Science Policy Network as Director of Communications is really to support and facilitate all of this by communicating with our network and our members about the opportunities that we offer.

[00:08:12]To support them in the work that they're doing, to support them in new work that they might do. And then also beyond that to build more membership, to build our network and grow our brand so that we can cultivate new and meaningful partnerships, both in policy, in the public sector, and then also with other companies or agencies that are interested in engaging with us on this work.

**Ellie:** [00:08:42] That sounds awesome. We want to ask though, why did you choose science policy specifically? You know, you made the change from being at the lab bench to this role where it seems like you are the one that's making bridges between NSPN and other parts of industries and companies and academia as [00:09:00] it sounds.

**Caitlin:** [00:09:02] Yeah. Like a lot of other people, I got really passionate about science policy and, and ultimately really learned what it even was following the inauguration of President Trump back in early 2017. So I was very much fueled to engage by a lot of the rhetoric and decisions around many policies. I think the Paris Climate Agreement and pulling out of that was a really big and obvious one, as well as a general wave of anti-science was a pretty big and devastating wake up call for a lot of scientists about the state of our nation, in the world, and also our future. But a lot of those things are really are imminent; we are experiencing climate change on a daily basis. And I think for me, while I enjoyed my research and the issues that I was learning about in the lab, [00:10:00] these things felt very weighty.

[00:10:03] And I had a moment where I sort of realized if there's no planet for us, no future, really to be doing this research in, does it matter if I understand a little bit more about how the nervous system is put together during development? And that's not to say in any way that basic research and doing this work is not valuable, that needs to continue. But for me as an individual, whether it was my neuroscience interests and looking at that more big picture intersectionality, rather than just what's happening with one cell or my liberal arts education, I wanted to do something that was really communicating between disciplines that had an impact for regular people every day.

**Ellie:** [00:10:51] That's amazing it sounds like you're very much fulfilled by your job so I'm very interested in how you're able to integrate that interest into your job at [00:11:00] NSPN.

**Caitlin:** [00:11:01] One of the things that I love about what I do is I get to connect other people who are doing all kinds of different things across the country. For example: a group of people in Missouri who are working on or thinking about maternal mortality rates and another group of people who are thinking about the policy for this in rural Georgia, and what would

be a better approach to get better services for women in these areas. And you might think about maternal mortality and not immediately make the connection to science, but of course, there's data in that about, you know, who is getting seen by which kind of providers? When? How often? What are the other resources available to them? And we can start to make decisions about, "how could we do that better"? How could we get better access and service? What kinds of incentives actually work to get providers in rural areas? [00:12:00] And I love building those bridges and connecting those people.

**Ellie:** [00:12:03] Thank you Caitlin I'm now going to transition to Nina, my co-host for this episode, who will be asking further questions about policymaking and how scientists in particular are able to lend their expertise to these kinds of decisions and decision-making processes.

**Nina:** [00:12:19] Thank you, I appreciate that. Caitlin, thank you for being here with us today; for the listeners at home, I'm Nina. The amount of research and even backgrounds of our elected representatives really shapes policy. Thinking back to your mention of maternal mortality, an example of policy using the scientific and healthcare background of some of its co-sponsors to its benefit has been HR 4995 or the Maternal Health Quality Improvement Act. Targeted at improving conditions in rural areas, this bill has sections targeted at addressing implicit and explicit bias in healthcare, creating comprehensive healthcare (which is respectful of the challenges that may come with being in a rural area), and identifying best practices while expanding its medical workforce. A few [00:13:00] of the co-sponsors have backgrounds in nursing as well as medicine. And it is one good example of how science, via medicine in that case, can impact legislation.

[00:13:08] When we think about science in terms of policy, what exactly would you say is the perspective of a scientist in policymaking and why is it important? Why do we need these scientists to have an active role in policy beyond the fact that scientists are part of society? What is it that scientists can add to the conversation ?

**Caitlin:** [00:13:25] Yeah. I mean, I love that you mentioned scientists are part of society because sometimes we forget that we're citizens too. And this can be part of your civic engagement and your civic duty, but also as you mentioned, scientists have specific unique skills. And of course, if they're serving in government themselves, most representatives are generalists. They have to be able to handle lots of things, but I think scientists are very comfortable not knowing things or being uncomfortable. I think that is a huge asset [00:14:00] because you know how to find answers, you learn very quickly how to ask people the right questions, how to find experts, and also scientists have a lot of training in doing analysis and understanding "what are some of the different things that need to be considered in terms of what is effective or not effective" and how to make some of those decisions and how to answer those questions.

[00:14:31] Another reason it's important to have scientists as representatives is that they are significantly underrepresented right now in our government. I think it's important to have a representation of people in government at all levels that reflect society, for race, background, experience and training. Most of our policymakers have a law degree or [00:15:00] sometimes no degree, depending on where they're serving. And I think having more people who are accustomed to thinking critically is really important. I think that these other skills that they bring are incredibly valuable, especially if we pair them with engaging lots of people

from the community, specifically highly impacted communities in that decision making process.

[00:15:25]Whether it's my training or being in this role that I love is being a bit of a generalist. I really enjoy being able to get my feet wet and dig my fingers into lots of issues. And through doing that, getting exposed and connecting with experts in those areas, and then helping them communicate or connect with other people who might be experts in a different area. And so I love being able to take things back into that, that bigger picture. Think about who are all the people who need to be at the table or in the conversations that we're having around these issues. [00:16:00]

**Ellie:** [00:16:00] Thank you Caitlin. So up until now, we have covered the themes of interconnectedness, representation, and generalism. This last idea of generalism is almost antithetical to what a scientist is and what their training really entails. As we know, scientists occupy very specific niches in their respective fields. However, Caitlin's scientific training has evolved into an ability that spans many different topics and issues that she handles at NSPN.

**Nina:** [00:16:26] Approaching topics with analytic precision, conducting research, and thinking critically about outcomes are not only skills useful in science, but in policy as well. And just as science requires foundational knowledge to understand implications of research or future developments, so does policy. Let's get into some basics!

[00:16:45] We just came out of a particularly interesting election season that felt like it was never quite going to end. Now that we're going into a transition period, we're beginning to see changes occur, and there's a dialogue forming. Many Americans are familiar with three branches of [00:17:00] government, but not as familiar with how policy is made. Not everyone did the Schoolhouse Rock, "this is how a bill becomes a law" or studied policy, but they all still want to know what's happening. Per Tip O'Neill "all politics is local", and those at the federal level are local to all Americans in a sense. Caitlin, can you talk a little bit about how policy is made at the local level, and how that local policy becomes national policy ?

**Caitlin:** [00:17:23] Yeah, I think this is a huge question. And I think a lot of it can vary depending on what level or regional location we're talking about. But ultimately, like you said, at the national scale, we have some set of representatives who we elect. Of course, there are some people who are involved, who are also selected usually those are part of your executive branch. And so just like at the national level, at the local level and the state, you have your executive branch or in your city, you have your mayoral office, right? And so you have those [00:18:00] pieces that are functioning as part of this, and then you have your representatives or your legislature.

[00:18:05] But regardless, all of those individuals are elected. And so they serve to represent the people in their districts and they work together with your executive department on some schedule, often it's annual for some places it's every two years to put together a budget for what they're going to do and how they're going to allocate money, most of which is received by taxes that they collect to provide services to their community.

[00:18:38] And so they have their bills, which include funding, that as part of the budget, that are put together, and then they always have some period for comment and reflection from the community, from scientists, from other offices where they are publicly available and go

through certain amount of [00:19:00] revisions until eventually they are ideally approved by your executive branch.

**Nina:** [00:19:05] The quote, "All politics is local" attributed to former Speaker of the House and Massachusetts Congressman, Tip O'Neill, comes from the idea that a politician must understand and appeal to the needs of their constituents in order to be impactful. Local problems require local solutions, and fully understanding these issues allows representatives to go to our nation's Capitol and address the needs of their direct constituencies, as well as the needs of other citizens.

**Naira Abou-Ghali:** [00:19:30] So once you have a bill that's been approved and has a budget associated with it, Caitlin gives us an example of what happens next and what regulations are in place.

**Caitlin:** [00:19:42] I have a friend who works at the Wisconsin Department for Children and Families running their Youth Justice Program. Every two years they get some amount of money and then their office, which is part of the executive branch of the state government is responsible for allocating that [00:20:00] money to all the counties across the state with a set of expectations and rules for how to use that. And so those are those policies and laws, some of which are regulated in different ways by different agencies. You know, not all of them are regulated by police. And they get information back from those individual counties about how effective those programs are, their youth justice programs in terms of keeping children and teens out of the criminal justice system. They collect data and use that to then inform future decision-making for that funding and those programs, which are state provided

**Nina:** [00:20:45] Totally! We've talked a bit about how important science is and its foundation in democracy, but what would you say your favorite part about having scientists represented in Congress happens to be?

**Caitlin:** [00:20:57] Oh, that's a tough question. I think it's just [00:21:00] really incredible and inspiring anytime you can see someone who is in a leadership position, who you identify with in some way. In addition to the skills and training that they bring, they also have unique problem solving perspectives and institutional knowledge of their field. That can be really valuable, particularly if say their background is in health and they're serving on a committee that's associated with public health or pandemic response. And having more expertise in those areas is definitely a boon to our political enterprise, if you will.

**Naira Abou-Ghali:** [00:21:38] Caitlin also mentions here that she's so excited to see more women and minorities represented in Congress, along with the fact that they might be scientists, or come from more scientific backgrounds. Let's hear more about Caitlin's career advice for graduate students looking to enter a science policy. [00:22:00]

**Ellie:** [00:22:00] Caitlin, how would you give advice to a rising graduate student who's interested in pursuing science policy? Are there other avenues that you could discuss with rising scientists?

**Caitlin:** [00:22:13] I think the first step is to get connected to other people who are doing that kind of work; to learn from their experiences, whether or not that's by joining a group at the national level, like the National Science Policy Network or joining a local group or chapter doing advocacy and science policy work. It can also be simpler than that. It might be doing

informational interviews with someone in those organizations or somebody else that you meet that might be a professor who's very actively giving comments or responding to bills. Read the Federal Register; see what are the bills that are coming out, that you have expertise in or interest in and comment on those. [00:23:00] Maybe even working on a task force , as appointed. That happens more at the federal level to some extent with the President's Council of Science or the Office of Science and Technology Policy, which is part of the executive branch. I think those are some really easy steps to get involved. Another way to reach out might be through your graduate program's alumni network and find people who are doing that, who have your training or very similar training and background and learn about what they're doing, why they do it, and how they were able to do that. There are tons of fellowship opportunities, both for people with their Master's, their PhD. Many of those are full-time, and they're a really immersive, intensive experience. There's a lot of ways to get involved and engaged sooner and just to find out what it is that you're excited and passionate about.

[00:23:56] For more information about the Federal Register, how to [00:24:00] contact your representatives, and to learn more about the President's Council of Advisors on Science and Technology, check out our resources page linked in the description or visit our website at politicsunderthemicroscope.com.

**Nina:** [00:24:13] That's really awesome, thank you! Anne Frank once wrote, "How wonderful it is that no one need wait a single moment before starting to improve the world"-- if I'm remembering that quote correctly. And it's important for members of the scientific community to know that there are a multitude of ways that they can actively and positively impact government. Every voice matters. And whether someone has provided the framework for you, or you forge a novel path, there are so many ways to pursue policy. Now into the fun part of this! What's the coolest thing you've worked on lately, and have you done any work with regards to the current pandemic ?

**Caitlin:** [00:24:46] I have definitely worked on and helped support a lot of really amazing and incredible initiatives around the pandemic and thinking more broadly about bringing science into policy at lots of [00:25:00] different levels. In mid-March, we got this "Ask a Scientist" program going with the Federation of American Scientists. We wanted a way to really rapidly get accurate information to people, and we built this chat bot essentially that would have a lot of vetted information for anyone in the public and then, if people would ask a question that we didn't have information for, it would be filtered to a group of volunteers. We recruited over 600 volunteers and answered nearly 2000 different questions, in a few weeks to improve the quality of data and information that was available to people. It was really exciting to see how quickly and how rapidly we could recruit people from all around the country. We also had to think about recruiting scientists who had other language expertise, so that we could also translate these [00:26:00] answers. That was really important that, it's not only simply in English for everyone because that's not sufficient.

[00:26:07] I also know that there is a group of members of NSPN as well as a number of other organizations in New York City who very rapidly put together a system for doing coronavirus testing, particularly in lower income neighborhoods. We were able to provide some financial support for them to do that as well as a group in the San Francisco Bay area, with the University of California at San Francisco that were making hand sanitizer in their lab

and then distributing it to prisons, jails, and low-income communities in the Bay area, as well as information about the virus to them to help bridge those gaps.

[00:26:50] And we're thinking about other kinds of initiatives and working on projects to talk about vaccine hesitancy and engaging with your local communities and [00:27:00] how to talk with them effectively and communicate around encouraging people to get the vaccine. One of the things that I'm really excited about is our science diplomacy team launching this new project where our members can apply and then be grouped in small clusters of individuals to work with science diplomacy organizations on doing actual science policy analysis, making recommendations, different kinds of tangible outcomes that I think are really valuable skills for them, and will help them grow in those areas. That's called the Science Diplomacy Exchange and Learning program or SciDEAL.

**Naira Abou-Ghali:** [00:27:41] If you would like to learn more about the science diplomacy exchange program hosted by NSPM check out our pop-up episode, which airs on January 25th, where we will interview the vice president of the science policy committee at NSPN to learn more about the program! Feel free to check out our [00:28:00] resources page below for links to the program description!

**Nina:** [00:28:03] Thank you so much, Caitlin and truly, you've been incredible. Just one more question: you talk a bit about advocacy and policymaking. Access looks different for different people, and in talking about the COVID vaccine and access, how can scientists advocate for underserved communities and try to assure that there is adequate access to the vaccine, no matter the racial, linguistic, or class barriers? We also know that there is a history of scientific and medical exploitation in America, such as the Tuskegee Experiment, and this can impact the perceptions of science. What are ways that you think scientists can begin to address the disparities around this vaccine and this history ?

**Caitlin:** [00:28:40] I think this is why we need scientists in government, and need those scientists to come from a diverse set of backgrounds. People need people like them to speak for them because I can't speak for someone who doesn't have my [00:29:00] own experience. Of course I can stand up for them. I can advocate for them, but I don't really know what they need; they know what they need. We need these people in government to be able to say, "Hey, this is what we need at the table". We need people at, you mentioned the communication with communities and that side of things. We need people who have shared identities with a lot of those communities to be able to talk with them about what's going on, to share why the data is okay, and why this is safe. And it is a huge undertaking because there is a lot of very, very real and valid hesitancy around engaging in any type of scientific research or in getting vaccines. Of the things that we can all do as say, you're a scientist doing your science and you don't have a role in government is through advocacy. And that looks like [00:30:00] calling your representatives, that might be reaching out to people in your Public Health Department. Being able to get your voice and get others who have their voices that need to be heard to speak up and to be loud, make noise, be annoying, because as we mentioned earlier, representatives are intended to represent their constituents. And they have to listen.

[00:30:29] But also some of these other departments or programs or places where you see that intersection that had an impact are really great, I think as well to engage with them. And of course, there's sort of your one-off advocacy, but to build relationships through that, to

share the skills and the resources that you can. Come with an ask and an offering in any of these cases: "Here is, the evidence why, and here's what I can give you, and here's what I can do, and here's what I want you to do with it". [00:31:00] Those are just a few things that I think can help people think about how to actually try to impact change, because it can be really overwhelming to know where to start. This is another reason why it's really helpful to work in groups and with other people who have a shared vision and a shared mission because you're not doing it alone. You can do it as a group locally, you can do it as a group nationally. It doesn't matter, but you're able to take something tangible and bring it to the people who are making the decisions and to put pressure on them to make better decisions with the evidence.

**Ellie:** [00:31:40] Thank you so much, Caitlin. It sounds like there are so many things that even young scientists can do to really instigate change. One of which I think is amazing is to be annoying, be as loud as possible and to advocate for not only ourselves, but everyone around us, everyone on this planet and everyone in this country, especially. Thank you so much for all of your insight [00:32:00] and thank you for being interviewed on Politics Under the Microscope, it's been an absolute pleasure. I can speak for all of the hosts when I say that, and we cannot wait to see what you and the rest of NSPN accomplishes in the future.

**Caitlin:** [00:32:13] Great. Thank you so much to all of you. It was lovely to see you again Ellie and wonderful to meet you, Nina.

**Naira Abou-Ghali:** [00:32:20] Thank you for listening to the very first episode of Politics Under the Microscope. Please give us your feedback on this episode by taking the survey linked in the episode description and on our website. For more information about anything mentioned in today's episode, check out the resources page on www.politicsunderthemicroscope.com.