

A career in science policy and diplomacy: from Banana Slug to diplomat

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ABSTRACT There are 535 members of Congress, and only two of them are trained research scientists. Yet the greatest threats the United States and the world face today require science to solve them. Climate change, infectious disease, food and water security, loss of biodiversity, environmental degradation, energy shortages, terrorism, social inequality, the list goes on. What you may not realize is that science and scientific evidence is not necessarily informing the policies and programs that combat these threats. In this *Perspective*, I take you through my own professional path, from graduate student to senior policy advisor in former President Barack Obama's Office of Science and Technology Policy. I attempt to illustrate that scientific training can (and should) be applied to a diversity of careers, including my own in science policy, and international diplomacy.

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RISK AND REWARD

I graduated from the University of California, Santa Cruz (home of our beloved mascot, the Banana Slug), determined to use my passion for science and social justice to make the world a better place. Undecided about graduate programs, I worked at a startup pharmaceutical company as a research associate, interested in learning about drug development. It was a wonderful experience, but after 2 years, I was certain I wanted to pursue a graduate degree in biological sciences. I was lucky to be accepted into the Johns Hopkins School of Medicine for graduate school, and even more fortunate to have Nancy Craig as my principal investigator (PI). She encouraged my ideas and my exploration of novel approaches that weren't necessarily in her area of expertise. As a result, my research was highly collaborative across campus and, fortunately, went well. While graduate school was challenging, I enjoyed it and began to see results early. Midway through my training, Bruce Alberts (then president of the National Academies of Science) visited campus to give a talk on the work he was doing to leverage scientific evidence in meeting the UN Millennium Development Goals (MDGs). I suppose I always

assumed science helped inform policy, but this was the first time I made the connection between scientific research and policy. Of course, coming from Bruce, who was also the editor of *Science* and an author in *Molecular Biology of the Cell*, made the message incredibly powerful. He was a friend of Nancy's from their time at the University of California, San Francisco (UCSF), so I got to meet him after the talk. He was immediately approachable and down-to-earth. He was encouraging. I felt a real connection with him and his passion for international development.

A few years later, as I drove to my new postdoctoral position at the National Institutes of Health (NIH), news came over the radio of a plane flying into the World Trade Center. I arrived to my laboratory to hear another had hit the Pentagon, with panicked reports of more heading to Washington, DC. I went home, and the day unfolded. I could see black smoke billowing from the Pentagon from my apartment in Georgetown. It's tough to say what impact that day had on my career path, but it was certainly a factor in my decision to explore a different career path than the one I was trained for. One thing was for certain as I considered the leap: I was terrified and felt that I was falling short as a scientist.

TAKING A LEAP

I applied for an American Association for the Advancement of Science (AAAS) Diplomacy Fellowship, which places PhD scientists into federal agencies for 1–2 years. My PI and many of my colleagues at the NIH were supportive, but doubtful. They thought I was throwing away a very promising career, and all that I had learned would be "useless after 2 years away from the bench." To my genuine surprise, I was awarded the fellowship. I knew nothing about policy or

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Abbreviations used: AAAS, American Association for the Advancement of Science; MDGs, Millennium Development Goals; NIH, National Institutes of Health; OSTP, Office of Science and Technology Policy; PI, principal investigator.

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how the government worked, but it sounded fascinating. I was honored, scared, and more excited than at any other time in my life.

I accepted the fellowship and was placed at the Department of State, in the Office of Cooperative Threat Reduction. My job was to engage former weapons scientists in the former Soviet Union in an effort to “redirect” their skills to peaceful use. The anthrax attacks on Congress were a wake-up call to the United States and the world; we were unprepared for a biological attack, and Congress wanted us to do more. My office received emergency supplemental funding to develop policies and programs that improve “global health security.” My third day on the job I was sent to Siberia (Novosibirsk, Russia), to meet with scientists of VECTOR, the infamous virus research institute (Warrick, 2002), which specialized in weaponizing disease agents, including smallpox.

Despite the original Cold War mission of these labs to create weapons, what I found in Russia was the same as what I would go on to find all over the world, from Jakarta to Islamabad to Tbilisi: scientists share a common language, a passion to improve the human condition, and a willingness to collaborate on topics of shared interest, despite political divisions. Even as a fellow with no diplomatic experience, I came to realize that my training as a scientist prepared me well for my job as a foreign affairs officer. There was much to learn, but there was also so much to contribute to policy making.

I was hired into a permanent position at the State Department after my first year as a fellow, and I stayed for nearly a decade. I slowly developed my skills as a diplomat, bureaucrat, and policy maker. My scientific background gave credence to my subject matter expertise, and in time, I was trusted to chair interagency policy roundtables, draft memos and white papers for senior officials, brief congressional staff, make important funding decisions, and begin to shape policy within my domain. I worked closely with Congress to develop new health security programs around the world and traveled extensively across South and Southeast Asia, the Middle East, and North Africa.

Anyone interested in policy knows that Capitol Hill is where the action is. In 2008, I was drawn to work on “the Hill” as a Brookings Legislative Fellow, serving on the Senate Homeland Security and Government Affairs Committee. As our first branch of government, Congress is not just setting policy; they are making laws. I worked on a fascinating piece of legislation relating to both domestic and international biosafety and biosecurity before returning to my position at the State Department.

A NEW BEGINNING

Shortly after my return, I received a call that would change my life. President Obama had just given the “New Beginnings” speech (Obama, 2009a), which called for a range of science engagement programs with Muslim-majority countries; I was asked to lead the effort, as the senior policy advisor for global science engagement in the Office of Science and Technology Policy (OSTP), led by President Obama’s science advisor, John Holdren. It was the opportunity of a lifetime.

My first task was to launch the “U.S. Science Envoy” program, which deployed prominent American scientists to specific countries in an effort to listen carefully and develop meaningful relationships, policies, and programs on topics of mutual interest. Obama’s national security strategy (Obama, 2010) clearly articulated that the greatest threats we face as a nation are the global grand challenges we all share—climate change, infectious diseases, energy shortages, food and water security, and so on. These are global in nature and require global collaboration. Like the MDGs, science is essential in making progress. The envoys were the tip of the diplomatic spear,

deployed to change the conversation and return with a better understanding of how we can move forward, together.

Through an elaborate selection process, Bruce Alberts, Elias Zerhouni, and Ahmed Zewail were named the first three U.S. science envoys. Almost 20 years after I had met him at Hopkins, I was tasked to staff Bruce for this important presidential initiative. It was a short walk from the White House to the AAAS headquarters where Bruce was serving as editor in chief of *Science*. I knew I was about to embark on a fantastic journey with one of the greatest scientific minds; what I didn’t realize was just how incredible Bruce is, and how profound an impact the program would have.

Bruce was assigned Indonesia; it’s hard to overstate how important Indonesia was at the time. The president spent part of his childhood living in Jakarta, and his rise to the American presidency was a great point of pride for Indonesians. As the nation with the largest Muslim population in the world, Indonesia was an important and interesting challenge to engage on the idea of a “new beginning” with the United States. Bruce and I prepared for months. I had worked in Indonesia during my time at the State Department, and I knew the key issues and players there. He would be the first presidential envoy to be deployed to Indonesia from the Obama administration, making his trip truly a monumental event.

In President Obama’s inaugural address, he stated his intent to “restore science to its rightful place” (Obama, 2009b), and later gave a landmark speech at the National Academies of Science 150th anniversary (Obama, 2013) with the message “Science is more essential for our prosperity, our security, our health, our environment, and our quality of life than it has ever been.” This reflected his deep belief that evidence-based policy making is essential. President Lincoln created the academy with that very premise in mind. As we prepared for Bruce’s trip we were notified that the Indonesian president Yudhoyono would address the Indonesian Academy of Sciences upon Bruce’s arrival. A sitting president had never before addressed the Indonesian Academy of Sciences. This would be a landmark event, signaling the president’s dedication to leveraging scientific evidence in policy making, improving education, and investing in science and technology in Indonesia.

I had previously worked closely with the president of the Indonesian Academy of Sciences, Sangkot Marzuki, who had been working to revive the academy for many years. Together, we had organized events and laid the groundwork for an Indonesian science fund, modeled after the U.S. and other Western scientific “ecosystems.” Bruce’s arrival and President Yudhoyono’s address created an unprecedented opportunity to align the United States and Indonesia on science and technology policy.

Bruce and I had the great honor of meeting privately with President Yudhoyono and his entire cabinet. Bruce and President Yudhoyono shared a passion for education, and they spoke on a range of topics, all focused on policies and programs that would improve the lives of Indonesians and Americans alike. The door was open, and we had much work to do.

Bruce was officially the U.S. envoy for 1 year, and we made the most of it. We secured State Department funding for a U.S.–Indonesian “Frontiers of Science” cohort, and made many more trips across Indonesia’s vast archipelago. Of course, we worked closely with Sangkot Marzuki and the Indonesian Academy of Sciences, bringing with us the depth of contacts and resources Bruce had accumulated over his impressive career. When his appointment ended, Bruce didn’t seem to notice. He continued to work every bit as hard to bring all that was promised to fruition. He urged me to leverage

the networks and resources of U.S. scientific associations, as well as universities, something I worked hard to do from my vantage point at OSTP. This led to my interest in working in the nongovernmental sector after leaving the White House.

FOLLOW YOUR PASSION

I went on to start my own nonprofit, Health Security Partners, which is focused on international scientific collaboration, education, and stewardship. Today, I am the executive director and advisory board chair, bringing together my collective experience and passion for science, diplomacy, and international security. I remain close to policy makers on the Hill and in the executive branch, serving as consultant and advisor on a range of health security policy issues. I hold a faculty appointment with Cornell University, teaching health security and diplomacy at the Cornell in Washington program. I continue to teach, because it keeps me up to date and allows for mentoring early-career students.

INSIGHTS GAINED

If you are interested in using your science training in a career outside of academia, here's my advice:

1. Follow your passion.
2. You will fail. Keep trying until you love your career path.
3. Volunteer for things you are interested in, even if you are not good at them.
4. Don't define your success by your current peer group. Your training can be applied to many fascinating and rewarding careers.
5. Never rest on your laurels.

If you are interested in a career in science policy, international affairs, or science diplomacy, here's my advice:

1. Work on the Hill. There are 535 members of Congress, and currently only two of them are trained research scientists (Manning, 2018). They need you now more than ever.
2. Consider joining the Foreign Service (<https://pathtoforeignservice.com/join-foreign-service-pros-cons>). They need you now more than ever.

3. Consider a job in the intelligence community (<https://www.intelligencecareers.gov>). They need you now more than ever.
4. Consider a career in international development; the U.S. Agency for International Development (www.usaid.gov/what-we-do/science-technology-and-innovation/science-usaid) has phenomenal programs leveraging science to improve the lives of those most in need.
5. Go to work at the Defense Advanced Research Projects Agency. It's where truly innovative science is tested to help the war fighter. Very cool.
6. Get a mentor. Find someone in the area you are interested in and invite that person out for coffee. If he or she is willing to give the time, this will have a profound impact on your career.
7. Consider an AAAS Fellowship (AAAS Science & Technology Policy Fellowships: www.aaas.org/program/science-technology-policy-fellowships). A fantastic way to transition from the bench to something entirely new.

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