TURNING POINT Award helps in fight against paediatric malaria in Kenya **p.425**

POSTDOC JOURNAL Scientists should beware of academic survival tactics **go.nature.com/3fttcj**

NATUREJOBS For the latest career listings and advice **www.naturejobs.com**

CORBIS

INTERNATIONAL OPPORTUNITIES

The science of diplomacy

The US government employs researchers to delve into matters of state. But a special set of soft skills is essential.

BY KAREN KAPLAN

In January, Sharon Hrynkow was preparing for a meeting of health ministers from the eight nations with territory in the Arctic. A lot was at stake and Hrynkow, a neuroscientist with a long-standing interest in global health, had a key part to play. As senior adviser to the assistant secretary of the Bureau of Oceans and International Environmental and Scientific Affairs (OES) in the US Department of State, she was to help the United States decide on priorities for the meeting's agenda and inform the health-science topics covered, such as climate change and global health. As sea ice shrinks, the region is facing escalating pollution from oil and gas exploration as well as a rise in commercial shipping. Navigating such tricky terrain can be further complicated by territorial disputes between nations. But Hrynkow was undaunted by the prospect — it is just part of her job.

Hrynkow is not the only scientist who has found her way into international relations and diplomacy. Although US science diplomacy and international policy do not have a well-defined career path, researchers with the right combination of tact, finesse and negotiating skills may find niches in government agencies, science societies, non-governmental organizations or industry. Scientific acumen is not enough: to make their mark, scientists need a passion for international issues with science import, a knack for and interest in building relationships, and a curiosity about and fascination for other nations and cultures. "From the scientific perspective, the diplomatic community is an important ally, as it can pave the way for exchanges of scientists, help foster international research partnerships and build relationships to spur innovation," says Hrynkow. At stake are global issues such as climate change, food security, pandemic disease and trans-boundary pollution.

LEAVING THE LAB

Hrynkow started on the diplomatic path early in her career. She has worked with officials from other nations on international and global-health issues for nearly 20 years, since finishing her postdoc at the University of Oslo. Hrynkow had travelled to Norway to conduct research using retroviruses to study the developing brain, but after completing the project, she realized that she preferred to leave the lab. Hrynkow decided to apply for a Science & Technology Policy Fellowship from the American Association for the Advancement of Science (AAAS) in Washington DC to explore her long-standing interest in international issues. She was posted to the OES, where she helped to develop US policy on AIDS.

After Hrynkow's fellowship ended, the bureau hired her. "I was the first full-time health scientist within the OES and the state department as a civil servant," says Hrynkow. Since then, she has held executive positions at the John E. Fogarty International Center of the US National Institutes of Health (NIH) in Bethesda, Maryland; the United Nations Foundation in Washington DC; and the NIH's National Institute of Environmental Health Sciences in Research Triangle Park, North Carolina. Now she's back at the OES, working to advance the American global health mission. Although she does not work as a neuroscientist, Hrynkow notes that she has applied many facets of her degree to her work. At Fogarty, she helped launch a programme ▶

© 2011 Macmillan Publishers Limited. All rights reserved

on brain disorders in developing nations; and throughout her career, she has relied daily on her scientific values, including transparency, the importance of peer review and open competition. "Having a solid understanding of how science is conducted in this country is helpful as we reach out to partners abroad," says Hrynkow.

FEDERAL CASE

Although the US government has long recognized the importance of science in international relations, diplomacy and policy-making, there aren't a huge number of federal positions available. But the situation may improve. The state department — which manages US relations with the governments and people of other countries — hopes to boost its science-and-technology-based diplomatic corps, says Andrew Reynolds, deputy science and technology adviser to the secretary of state. An important gap, says Reynolds, has emerged in the number of foreign-service officers with science backgrounds. In the 1990s the department's ranks thinned; as people left, they weren't replaced. In addition to foreign-service officers, the state department employs foreign-affairs officers in the civil service who are based in the United States but are sometimes called on to travel.

Reynolds notes that the department's first Quadrennial Diplomacy and Development Review (QDDR), released in late 2010, calls for science and technology to be incorporated into current and future international-development policy. "Science, engineering, technology and innovation are the engines of modern society," the state department said in the QDDR, "and [are] a dominant force in globalization and international economic development." The report, a review of the department's objectives and planned strategies, is closely tied to the first Presidential Policy Directive on Global Development, signed last September, which includes initiatives on health and climate-change research. The department has not yet determined how many people with science and technology backgrounds will be hired, or for which bureaux or divisions. It currently employs some 13,000 foreign-service officers and 8,000 members of the civil service. "We want to create a career path here for people in science, technology, engineering and maths," says Reynolds. "We need to restore our capacity."

"A solid understanding of how science is conducted is helpful as we reach out to partners abroad."
Sharon Hrynkow

The United States Agency for International Development (USAID) also has a foreign service, but its hiring outlook may not be good. The agency had been planning to expand as a result of a congressional initiative launched in 2008, which called for USAID to improve its ability to provide overseas support — a remit that includes anything from helping farmers develop stronger crops to creating maternal-health programmes. Under this scheme, the agency had been aiming to double the size of its foreign-service workforce, including scientists. But the plan could be in jeopardy as a result of possible federal budget cuts in future years.

Still, the state department and USAID aren't the only federal options for entering international policy. Depending on a scientist's field, he or she might investigate the Fogarty International Center, where positions could involve establishing a training programme in a developing country to help address health crises, or the National Institute of Allergy and Infectious Diseases in Bethesda, where one might build partnerships in infectious-disease research overseas. The US Centers for Disease Control and Prevention in Atlanta, Georgia, often has international opportunities in areas such as working with health ministries to build public-health surveillance systems in developing countries, or building global-health policies and programmes. And all US federal agencies with a science-oriented or technical mission have a foreign-service workforce.

FINDING A NICHE

Not all scientific diplomacy positions are government-based. Vaughan Turekian, chief international officer at the AAAS and director of the association's Center for Science Diplomacy in Washington DC, knew early on that he wanted to work in international relations, but he has largely avoided the civil-servant role, apart from an assignment as special assistant to the under secretary of state for global affairs at the start of his career. Once he had earned his doctorate in atmospheric geochemistry, Turekian knew that he wanted to widen his scientific scope. So he did a two-month stint as a visiting professor at the American University of Armenia in Yerevan, and worked at the US National Academy of Sciences in Washington DC, where he was the study director for a report on climate-change science that had been commissioned by the White House. Turekian believes that his international-relations efforts are as effective as those of the government. "The types of diplomacy that are outside the realm of government-to-government are focused on a problem, and you engage different parts of communities to help address that problem," he says. "You're involved in building a relationship. You're not there as a perceived threat."

Regardless of the sector, many scientists who work in diplomacy and international policy say that the most promising career path is through a fellowship. The most frequently cited programmes include: the AAAS Science & Technology Policy Fellowship; the Scholars and Fellows scheme offered by the Fogarty centre; the state department's Professional Science and Engineering Society Fellows Program; and the Embassy Science Fellows programme, co-run by the state department and the National Science Foundation, for those already working at a federal agency. Fellows in each of these programmes often work as science advisers. A doctoral degree is usually required, along with exceptional competence in one's speciality and an awareness of global issues.

"Scientists are treated with a certain level of trust that other government officials don't receive."

The AAAS programme in particular has a solid track record in funnelling former fellows — there have been about 2,000 since the programme began in 1973 — into positions. Fellows placed at the state department and USAID often find it an excellent stepping stone to a career in foreign policy, says Cynthia Robinson, the programme's director. The NIH has hired nearly half of the AAAS fellows that it has hosted in the past ten years. Robinson says that 43 former fellows now work overseas for the state department, in positions including consular officer in Mumbai, India, and foreign-affairs officer in Kabul. A further 43 work abroad for USAID in positions such as climate-change adviser for the Africa Bureau or health-development officer for the Office of Technical Support at the Asia and the Near East Bureau.

E. BRANSON/NIH

SKILL SET

All of these positions require soft skills that don't come easily to every scientist. Working in any tense international negotiation requires a knack for putting people at ease to comfortably discuss sensitive issues.

Alex Kahl, an AAAS fellow at the state department, credits his parents, who have spent their lives in sales, for his ability to win people over and gain support. His interest in policy began in graduate school and blossomed while he was working as a postdoc at Rutgers University in New Brunswick, New Jersey. He was studying polar ecosystems in Antarctica, where he lectured about the region to thousands of cruise-ship passengers. He quickly learned that he was good at engaging people and building relationships, and decided that foreign policy and international relations was a better career choice for him than research. He hopes to join the foreign service because, he says, science can open doors that may be barred to other bureaucrats. "Scientists are treated with a certain level of trust that other government officials don't receive," adds Kahl.

Turekian recommends that prospective diplomats build their communication skills

© 2011 Macmillan Publishers Limited. All rights reserved

by presenting at conferences, participating in science workshops and writing mock grant proposals for practice. The ability to write clearly and concisely, he says, is key. "Science diplomacy has implications for the way policy-makers look at something," he says. "You have to write coherent and understandable statements." He suggests that scientists write up as many abstracts as they can, both real and mock, to hone the skill of writing tightly and clearly.

Learning how to listen effectively and to treat one's counterparts from other cultures with respect is critical, says Peter Jackson, chief of the AIDS research review branch at the National Institute of Allergy and Infectious Diseases. Jackson, who has been doing international outreach work since the 1990s and has served as a fellow in a National Academies programme and at the state department as an Embassy Science fellow — for which he travelled to Croatia to work with the University of Zagreb on establishing best practices for its research office — says that it helps to immerse oneself in the target area before arriving. "Get some information about the culture, read up about the people in terms of the science involved in the mission, and understand what they're doing before you show up," he says. Once there, the visiting scientist should be respectful and courteous, says Jackson: "You've got to listen to what people are saying. You can't come in as the big Western scientist and say, 'I'm going to tell you what we're going to do'."

Branching out from one's area of expertise is also imperative. Turekian advises scientists intending to work abroad to seek out journal articles, conferences and workshops outside their specialities, to help them view issues through a different lens. "You can't compromise the science," he says, "but you have to understand that some of the ways in which things are communicated and the assumptions that one goes in with are not the same everywhere." Cultivating patience is also crucial, adds Turekian.

A scientist entering the diplomatic realm must become familiar with the concerns and priorities of the diplomatic community, says Hrynkow. They can do this by reading diplomacy journals and publications, joining diplomacy associations and organizations, and becoming active in related online communities.

Trans-boundary issues such as polar ice, the atmosphere and climate "offer perfect opportunities to get scientists from many countries working together", says Kahl. "If you have shared objectives and are working toward a common solution, you can build bridges." ■

Karen Kaplan *is* Nature*'s assistant editor for Careers.*

TURNING POINT
Collins Ouma

Collins Ouma became a molecular biologist to help thwart malaria's high mortality rate in his native Kenya. Last November, he won the Royal Society Pfizer award for his work on identifying genes that may confer protection to children suffering from severe malarial anaemia in western Kenya.

Why did you decide to study malaria?
I had a revelation between 1994 and 1998 while working on my science degree at Kenyatta University in Nairobi. I got sick twice and insisted on tests, which found I had malaria parasites. My symptoms were akin to what I saw when growing up, and I realized that my relatives probably died of malaria. This heightened my curiosity about factors that predispose people to severe malarial disease and even death. Little is known about the genetic and immunological basis of severe malarial anaemia, yet current estimates suggest that the disease causes between 190,000 and 974,000 deaths every year among children under five years old.

How did you get started in this field?
After my undergraduate degree, I worked for a short time as a molecular biologist at the US Centers for Disease Control and Prevention (CDC) malaria lab at the Kenya Medical Research Institute (KEMRI) in Kisumu. It was the perfect impetus to guide my research career towards the molecular biology of malaria. The CDC had the structure and equipment for the training I needed, but couldn't offer a permanent job. So I went on to do a master's degree at Kenyatta University.

What brought you to the University of New Mexico for your PhD work?
I met Douglas Perkins, a tropical-disease specialist at the University of New Mexico (UNM), while finishing my master's. He was in Kenya with funding from the US National Institutes of Health (NIH) and the NIH's Fogarty International Center to support and train local scientists conducting research on endemic diseases. He was directed to me at the exact time I needed to do a PhD. His grants funded me throughout my PhD and partially through my postdoc at UNM. As a postdoc, I spent three months training in the United States every year for three years, and the other nine months in Kenya conducting vaccine and genetics-susceptibility research.

Have you formed any collaborations between Kenya and New Mexico?
Yes. I'm an associate professor of genetics at Maseno University (MU) near Kisumu, and a postdoctoral fellow at UNM. I still do research both in the United States and in their collaborative labs at KEMRI. The three research institutions [UNM, MU and KEMRI] have established a collaborative relationship, but I'm interested in working with any group that is eager to help eliminate this disease.

Why did you apply for this award?
When Wilson Odero, a public-health researcher at MU, encouraged me to apply and offered a letter of recommendation, I got to work and wrote a proposal to set up a state-of-the-art molecular-biology laboratory at MU and to identify individuals to train.

How will you use the £60,000 (US$96,700) award?
Part of my work takes place at Siaya District Hospital in western Kenya. As children suffer the most from this disease, we intend to first identify molecules that can be used to design a malaria vaccine for children under five. Second, we will continue to identify children who are at risk of severe malarial disease. Over the past 8 years we have enrolled about 1,400 children. We have followed-up on about 800 children quarterly to see how they progress with drugs and in handling disease outcomes. We then associate their improvement with their genetic make-up to see if certain genes protect them against disease or increase their susceptibility.

What impact has your research had so far?
So far, we have reduced mortality rates from 22% to 7% among 1,400 children under five at this hospital in rural western Kenya. But my ultimate goal is to develop an effective long-lasting malaria vaccine through active research. ■

INTERVIEW BY VIRGINIA GEWIN

© 2011 Macmillan Publishers Limited. All rights reserved