

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." ■

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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