PHOTO: ADOBESTOCK

Snapshot from Ouagadougou: the picture shows the Place des Cinéastes in the center of the Burkinabe capital. The monument is dedicated to African filmmakers.

Max Planck researchers collaborate with partners in more than 120 countries. Here, they write about their personal experiences and impressions. Jason Hendry, a malaria researcher from the Max Planck Institute for Infection Biology in Berlin, documents a two-week trip to Burkina Faso. He is collaborating with researchers from the Institut de Recherche en Sciences de la Santé (IRSS) to help find ways to prevent the spread of drug-resistant malaria.

In April, at the peak of the dry season, Burkina Faso is swelteringly hot. Even in the shade of mango trees outside of the Institut de Recherche en Sciences de la Santé (IRSS) I feel I am burning. I check my phone: it is 42°C outside. Yesterday a student told me that Burkina Faso is, in fact, the hottest country in the world, and that April is their hottest month. I probably should have known that beforehand.

Thankfully, the laboratories of the IRSS are fully air-conditioned. I enter the DNA extraction room with a group of fourteen Burkinabé students in blue lab coats, and we begin to prepare a polymerase chain reaction (PCR), a method we use to replicate the DNA of malaria pathogens. We then sequence the DNA to search for resistances that are visible in the genetic material. I walk the students through the protocol: first, collect the ingredients (remember, some are frozen); second, calculate the volumes needed (always good to double check); third, mix by pipetting (gently, to avoid bubbles); finally, load the reactions into the PCR machine (and don't forget to update your lab book). We are in the first week of a workshop to help track drug-resistant malaria from the labs at IRSS.

Malaria is the deadliest parasitic disease on Earth. The World Health Organization estimates that it causes almost 600,000 deaths annually. About 95 percent of these deaths occur in Africa, which has an abundance of the mosquitoes that transmit the disease. Once bitten by a mosquito carrying malaria, you have about ten days before you fall ill with waves of fever, which can lead to organ failure and potentially death.

The good news is, if you get to a clinic quickly, there are affordable drugs that can cure a malaria infection in about three days. The bad news is that malaria parasites are now developing resistance to our best drugs. Against a resistant parasite, the drugs take lon-

POST FROM

OUAGADOUGOU, BURKINA FASO

ger to cure the infection and, in some cases, fail completely. Recent research has found these drug-resistant parasites beginning to spread in East Africa. If they continue across the continent, the already enormous death-toll from malaria will continue to climb. The public health community is worried. Given the time and cost required to develop new drugs, it's essential we track drug-resistant malaria as it spreads, so we can use our existing treatments most effectively. But how?

Collaborating with researchers from across Africa, we've developed what we think is a good and practicable solution: a sequencing device that costs less than USD 1,000, is as small as a smartphone, and can sequence the pathogen's DNA in just five hours. All we need is a small drop of blood from malaria patients. The pathogen circulates within a patient's blood, so we can extract and examine its genetic material. The entire analysis can be done locally, on a laptop.

Back in the laboratory, our first sequencing run has started, and I am standing beside Dr. Issiaka Soulama, who leads the malaria labs at IRSS. He is examining the results with his students huddled behind him. To everyone's relief, the sequencing worked. In just a few days, the students have been able to generate useful new data about malaria in Burkina Faso, by themselves. As I've been teaching them, they've been teaching me. In *Mòoré*, a common local language, the answer to "How are you?" is *Laafi* – which means "Healthy". To say "Thank you" is *Barka*. My research gives me the opportunity to visit incredible places, to work with committed students, and to meet inspiring scientists. And for that, I couldn't say *Barka* enough.

PHOTO: PRIVATE

Jason Hendry (34)

was born in Brampton, Canada. He did a PhD on malaria at the University of Oxford, and is now working at the Max Planck Institute of Infection Biology in Berlin. He is Co-principal Investigator on a project funded by the Gates Foundation to develop new DNA sequencing approaches for malaria.