



Jon Gilbert Fox

Tamutenda Chidawanyika works in the lab of Surachai Supattapone, MD.

## TRANSLATING SCIENCE TO MEDICINE

AS A CHILD IN ZIMBABWE, TAMUTENDA CHIDAWANYIKA SAW MANY PEOPLE AFFLICTED BY ILLNESS AND UNABLE TO GET THE TREATMENT THEY NEEDED. INFECTIOUS DISEASES WERE WIDESPREAD, SHE SAYS; HIV, IN PARTICULAR, WAS RAMPANT. “THE COUNTRY WAS ECONOMICALLY AND POLITICALLY STABLE AT THE TIME, BUT NEVERTHELESS LOTS OF PEOPLE DIDN’T HAVE ACCESS TO HEALTH CARE, AND SEEING THAT FUELED MY DESIRE TO GO INTO MEDICINE.”

***“Scientifically, she is very creative, and her work is impeccable. And not only is Tamu an outstanding scientist, she also adds an incredibly bright sense of joy and humor to the lab.”***

**T**ODAY, CHIDAWANYIKA IS REALIZING THAT GOAL AS AN MD-PHD STUDENT at Geisel, conducting research in the laboratory of biochemistry and cell biology professor Surachai Supattapone, MD, PhD, DPhil. A chemistry major at The College of Wooster in Ohio, Chidawanyika confesses that she didn’t anticipate a career in the lab. “Although I’ve always enjoyed science, I didn’t initially consider the possibility of doing both medicine and research,” she says, “but several mentors have shown me that the two go hand in hand. I now realize that we need more physician-scientists who are considering both sides of the health equation.”

Chidawanyika’s current research does just that, using a genetic approach to study the fundamental pathways involved in cell death in human cells. “Our lab is primarily focused on protein misfolding, which interests me because this mechanism leads to the pathology of many diseases, including neurodegenerative and cardiovascular diseases, as well as some metabolic disorders.” If researchers can try to find ways to ‘mimic’ these diseases and initiate cell death, she explains, then perhaps they can move towards formulating therapeutics which target genes that cause cell death in some of these diseases.

As part of her research, Chidawanyika is conducting a genetic screen using technology derived from clustered regularly interspaced short palindromic repeats from bacteria, commonly referred to as CRISPR. “This powerful technology allows us to efficiently knock out genes in cells. Using CRISPR, we generate libraries of cells with different gene deletions. We apply stressors to the libraries and analyze the surviving cells to determine the genes involved in cell death as a result of the specific stressor used.” This project is exciting, says Chidawanyika, because it allows for exploration of stressors and pathways affecting other macromolecules such as DNA, as well as different organelles, and this is a new direction for the lab. What’s more, the project not only includes a lot of interesting and complex basic science, but also has potential for strong health implications. “A lot of diseases are very dependent on how cells are stressed, and our work allows us to identify genes that make cells susceptible to those stresses.”

“We all feel so lucky that Tamu decided to join our lab,” says Supattapone. “Scientifically, she is very creative,

and her work is impeccable. And not only is Tamu an outstanding scientist, she also adds an incredibly bright sense of joy and humor to the lab.”

This joyful spirit is particularly apparent when Chidawanyika is queried about her interests when not behind a microscope. She happily confesses that on many evenings she can be found in rehearsals with the Dartmouth College Gospel Choir, an activity that brings her happiness and a sense of release. “If you’re stressed, you can’t scream on the streets, but you can bust out in song and no one minds,” she says with a delighted laugh. “I love the choir—the music just lifts me up and when I’m singing, I focus on the music and it gives my mind a break.”

Chidawanyika also adores the music of language. She grew up speaking English and Shona, one of Zimbabwe’s native languages; studied French in high school, and minored in Chinese as an undergraduate. “I’m fascinated by Chinese culture and I find their language characters absolutely beautiful. I wish I could learn more languages,” she says with a rush of enthusiasm. “It’s such a powerful thing when you can connect with people in their own language.”

Given her enjoyment of both medicine and research, Chidawanyika is uncertain where her studies will ultimately lead—she has an interest in health policy, she says, but doesn’t want to step away from research and medicine completely. “I feel an obligation to give back to the place where I grew up as well as to the community here in the U.S., which has given me so much,” she says. “I want to be able to do something that translates across the world.”

LORI FERGUSON