

PERSPECTIVES & OPINIONS

Rebecca Richards-Kortum

LESSONS IN REALITY

RAISING CONSCIOUSNESS
IN THE CLASSROOM COULD
HAVE A GLOBAL IMPACT

Keith Carter

As an HHMI professor, Rebecca Richards-Kortum gives students the same early exposure to research that influenced her career. Thanks to the generosity of a college physics professor, she got a year-long taste of laboratory research. Kortum liked the work but knew she “wanted to do something to impact humanity in a much more direct way.” Today, her research program at Rice University blends bioengineering with real-world health care. Kortum’s special interest is building science savvy in the classroom.

Every year, nearly 10 million children in developing countries die before they turn 5. Experts believe that about two-thirds of those deaths could be prevented with technologies that are feasible to implement in low-income countries. But transferring the benefits of research from developed countries to developing countries really requires a new way of thinking—one that incorporates technology development as well as public policy and management of health care delivery. These issues were the inspiration for “Bioengineering and World Health,” a college course I developed as part of my HHMI professor grant.

The course provides an overview of the major health challenges facing both developed and developing countries, using case studies to illustrate how new technologies can solve these problems in cost-effective ways. I think that students come away with a much better understanding of how precious health care resources are distributed in the world and how to make better decisions about their own health care.

While we designed the class for non-science majors, we found that it drew a broad audience, including science and humanities students. The diversity within the group brings interesting perspective to our discussions. In one assignment, for instance, students read a *New Yorker* article by Michael Specter about the scientific and ethical challenges associated with testing an HIV vaccine in Uganda. In class, we hold a town meeting to debate whether to take part in a clinical trial of the vaccine. Students play the roles of Ugandan citizens or the different scientists and policy makers quoted in the article.

Some promote the views of Marcia Angell, former editor of *The New England Journal of Medicine*, who strongly opposes research that doesn’t uphold Western ethical standards. She advocates, for example, providing treatment for all trial participants who stand to later develop HIV/AIDS, a policy that is virtually impossible in Africa, given the financial and infrastructure limitations. Others put forth the views of Edward Mbidde, director of the Ugandan Cancer Institute, who asks, “If we need to go to work and we cannot afford a Mercedes Benz, should we refuse to ride a motorcycle?” As one anthropology student pointed out, it’s difficult to teach people who may have a limited concept of Western medicine

about how a vaccine works. Another student—one who grew up in Africa—described how the culture of hope might affect attitudes about participating in research.

The course also explores how technologies move from the lab to the bedside. One example draws from my own research, which focuses on developing small, inexpensive microscopes designed to detect cervical cancer at its earliest possible stage. Last summer, students from my lab went to Nigeria to help conduct preliminary trials of these microscopes with my long-time collaborator, Michele Follen, a gynecologic oncologist from the University of Texas M. D. Anderson Cancer Center. Cervical cancer is the leading cause of cancer death among women in developing countries, but it’s completely curable when detected in the early preinvasive stage.

We have preliminary evidence that the course helps boost scientific literacy. A group of undergraduates—half had taken my class—read and discussed an article from *USA Today* about gene therapy for lung cancer. We videotaped the discussions and tallied the number of health care assessment terms they used. Health care literacy rates were twice as high among the students who had taken the class compared with those who had not.

Given that as many as half of Americans mistakenly believe that surgery can spread cancer, and that one in four thinks there’s already a cure for cancer but it’s being withheld by profit-driven industry, it’s clear we need to increase awareness of health care issues so that they may be addressed more realistically and with greater effect.

Based on our initial success, we have begun to transform our undergraduate educational programs at Rice to more broadly meet this important need. A new program, “Beyond Traditional Borders,” supported with an undergraduate science education grant from HHMI, will create a multidisciplinary educational concentration in global health. The program will feature an innovative curriculum using biotechnology and bioengineering to confront international health challenges.

INTERVIEW BY JULIE CORLISS. *Rebecca Richards-Kortum is Stanley C. Moore Professor and Chair of the Bioengineering Department at Rice University.*