

Within the US biomedical research community, Barry Bloom is perhaps the best-known public health scientist there is. He began his career as a basic immunology researcher and today is the Dean of the Harvard School of Public Health. He told *Nature Medicine* how a single visit to India 35 years ago not only reinvigorated his interest in disease research at the cellular level, but equally broadened it to a global scale.

## Barry Bloom

Becoming the Dean of the School of Public Health at Harvard University would, one presumes, require some strategic career planning. Yet the current Dean, Barry Bloom, insists, "I never *decided* to go into public health. If you had asked me three years ago before I became Dean of Public Health at Harvard, 'was I working in public health?' I would have said 'no.' I was doing the immunology and molecular biology of infectious diseases like everybody else."

However, Bloom's resume suggests that his appointment was not a total triumph of accident over design. He serves on a myriad of panels including the Fogarty International Center at the National Institutes of Health, the scientific advisory board of the National Center for Infectious Diseases of the Centers for Disease Control

and Prevention (CDC), he chairs the board of trustees for the International Vaccine Institute in South Korea, has advised the World Health Organization (WHO) in some capacity or other for over 30 years and is a former consultant to the White House on international health policy. How then did he make the transition from basic immunologist to internationally renowned public health scientist?

His recollections of his early research career are tinged with a sense of restlessness at doing "science for the sake of science." Of his research work at Rockefeller University in the 1960s he says, "the last thing that would have ever occurred to me in my graduate training was to do anything applied, practical or useful." During his assistant professorship at Albert Einstein College of Medicine, he co-discovered the first lymphokine, called migration inhibitor factor, but describes that *in vitro* work as a "reductionist system to take apart the black box of cell-mediated immunity." And he says the most valuable lesson he learned from his postdoctoral work in London with Rodney Porter was that he "is not a chemist." Porter went on to win the 1972 Nobel Prize for determin-

ing the chemical structure of antibodies.

The problem was that Bloom was keen to bring a sense of reality to immunology research. "A gang of us back then came to a simple-minded observation—that you could do basic science not using the dinitrophenyl hapten and ovalbumin, but using real antigens from real pathogens. This just wasn't done."

It was a trip to India in 1967 that reinforced Bloom's desire to make his experiments more realistic. The WHO asked him to apply his scientific knowledge to the most backward of diseases, leprosy, and Bloom embarked on a "fantastic, life-shaping" journey. "Leprosy seemed a great model for studying immunoregulation," he remembers, "it's a skin disease, so material is easily collectable for research and it suggested a lot

of interesting questions for study. This got me hooked on the Third World and I realized that I could study real bugs instead of synthetic haptens!"

A trip to Geneva a few years later marked the beginning of his immense respect for the WHO—a group he finds himself constantly defending to his peers these days. An "electrifying" meeting at WHO headquarters in 1974 brought together the two scientists who had discovered that the leprosy bacillus grew in armadillo tissue—Wally Kirchheimer and Gerry Walsh. "While they wouldn't talk to each other directly," recalls Bloom, "they both volunteered their stores of infected tissues and the WHO agreed to set up a bank to make these widely available. I found the power of WHO to bring people to a common cause inspiring."

But that was decades ago. Today, Bloom acknowledges that the WHO attracts much criticism and suggests this is because people have "exalted expectations of what the group ought to do." Yet, even he is at pains to defend the WHO's lack of action over HIV and AIDS and instead outlines one strategy that the WHO could have adopted. "With regard to AIDS treatment,

if you give every country that has AIDS, drugs, then resistance will develop as in Eastern Europe and Russia. What you need to do, in the developing-country context, are experiments to learn what kind of an infrastructure is required to use antiretroviral drugs in a way that is most effective in treatment, prevents resistance and ultimately is sustainable and cost-effective. WHO could have done this but they stuck to prevention. They were anti-drugs for a long time."

So what about the public health situation in his own country? Could Bloom apply his international health experience to domestic problems and take on the recently vacated post of CDC Director? "I would come out ground-up hamburger meat in three days," he exclaims. "I'm an academic, and the best impact I know of for improving the health of the world—including the US—is in academic institutions and universities. The most important thing the US could do in global health would be to create 100 times more collaborations with scientists in universities in developing countries."

He practices what he preaches. For example, using funds of \$25 million over 5 years from the Gates Foundation he leads a program aimed at transferring HIV treatment and prevention knowledge from Senegal, which has a prevalence of AIDS in pregnant women as low as 2%, to Nigeria.

And in parallel with his global health work, Bloom still runs a basic research lab at Harvard—one that employs cutting-edge molecular techniques to an applied problem, namely the development of a vaccine for TB. His team is also studying knockout mice to determine the genetics of why only 10% of infected people succumb to the disease.

It is precisely this juxtaposition of an ultra-modern research laboratory within an international public health department that defines Bloom's lifelong philosophy; in his own words, "We serve the poor best by learning first and then passing this knowledge on. It's cheaper in human and financial terms to prevent disease than to cure it."

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Applying the basics