TAKING THE INITIATIVE

Researcher Margaret Johnston—formerly with the International AIDS Vaccine Initiative—is leading the U.S. effort to vanquish HIV

by Bob Roehr

"The way to really stop the spread of HIV is to shut the barn door. And the way to do that is with a vaccine," says Margaret Johnston, who admits that seems like an obvious conclusion for a research immunologist to reach.

Yet it didn't completely hit home until Johnston looked beyond U.S. borders to a world where HIV affects more than 30 million people—a number that grows each day.

Her epiphany eventually led her to become head of the U.S. effort to develop a vaccine against HIV. Johnston is assistant director for AIDS vaccines at the National Institute of Allergies and Infectious Diseases. The programs she oversees stretch far beyond the National Institutes of Health to research laboratories across the country and into the far corners of Asia and Africa.

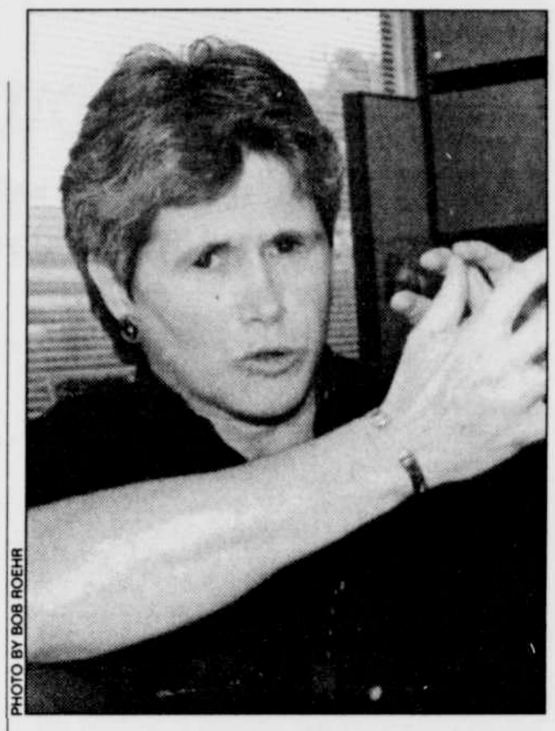

PHOTO BY BOB ROEHR

Johnston's office is bigger than most, but there is no mahogany desk, just a standard workstation and a circular meeting table that would be at home in a breakfast nook.

She is dressed casually in a charcoal-colored blouse and purple slacks. At 48 she still has the powerful, compact physique of a soccer player. Her voice is warm, friendly and self-confident.

Johnston says that while growing up she always felt she was different—just like so many gay kids.

"But it took a long time to really associate the word *homosexual* or *lesbian* with those feelings," she explains, adding that she came to accept her sexual orientation in her 20s and shared her realization with her family.

Meanwhile, there weren't many professional women as role models for bright young girls growing up in the early 1960s, especially in the Rust Belt decay that surrounded Pittsburgh.

Nonetheless, Johnston's aspiration of becoming a gym teacher changed in the ninth grade when a guidance counselor noted: "You're too smart for that. You should go into science."

Johnston took it to heart, eventually studying at Carnegie-Mellon University and Tufts University, where she received a doctorate. Next she went to the NIH for post-doctoral work. At each step along the way, she was encouraged by mentors who shared their love of biochemistry.

Johnston focused on interferon, a key protein that cells produce when exposed to a virus. She had her own lab and an established career at the Uniformed Services University of the Health Sciences, the U.S. military's crown jewel of research and training that sits across the street from NIH.

And then AIDS hit. In 1986 Johnston decided to join 22 people in what was then called the AIDS program at the National Institutes of Health. She closed down her own lab, leaving daily bench work behind to become a scientist and administrator.

The first paper she wrote at the National Institute of Allergies and Infectious Diseases pushed for development of protease inhibitors and combination therapy.

Johnston kept getting promoted in the rapidly expanding AIDS program, ultimately becoming its deputy director. But after a decade she was ready for a new challenge, which came in the form of the International AIDS Vaccine Initiative and her epiphany concerning vaccines.

In 1996, Johnston became IAVI's scientific director (and its first employee).

"I had seen the influence that people outside of government could have on the government," Johnston says. "Nobody was paying attention to vaccines."

So she set out to change the situation. Much of her time was spent outside the United States trying to increase awareness of and advocacy for a vaccine "from the people who most need it, those in developing countries," she explains.

Adds Johnston: "'Silence equals death' is just as applicable overseas as it is here. The leader of a country has got to admit there is a problem and be willing to do something about it, or else nothing will happen. That is what leadership is all about."

Nearly three years with IAVI has taught Johnston the political, ethical and logistical complexities associated with international research.

"It can't be anything other than a full partnership [with the developing countries] or it just won't work," she says.

She's also come to appreciate that a certain amount of chaos allows creativity to flourish.

"If everything is in a box and everything is too much rules and regulations, people will do the rules and regulations," she says. "But they won't think about what they are doing. They won't be creative or innovative. You need a certain amount of chaos to do that."

At IAVI, Johnston says, "I was the one trying to put the box around the chaos. I realized after a while that for me it's a lot more fun to be in the box and to be pushing, knocking the walls down."

Johnston returned to the walls of NIAID in 1998, in part because she had "gotten a little too far away from the science."

"Prevention is undervalued in our society," she says. "We need to find a way to give value to preventing something from happening."

Johnston admits that developing a preventive vaccine for AIDS poses a greater challenge than with most diseases. A main reason is that few people have recovered from AIDS, so researchers don't have a good handle on what parts of the immune system need to be stimulated with a vaccine to bring about protection.

"We have some intellectual guesses about what it might take, but we don't know," she says.

A few commercial sex workers and spouses have been repeatedly exposed to HIV and either have not become infected, or their bodies seem to be holding the virus in check. Thus Johnston believes there are answers to be found, and HIV vaccine trials underway in the United States and abroad will perhaps shed light on the matter.

Johnston cautions that a "successful" vaccine may look very different from what the industrialized world has come to expect—i.e., virtually 100 percent protection from infection with little risk.

Instead, a vaccine that works only half the time may be useful in helping to reduce the spread of HIV in places with very high rates of infection, such as southern Africa.

Though it may take a while, Johnston is optimistic an AIDS vaccine will be developed.

"We have more bright people thinking about it now than we did two to three years ago," she says.

■ BOB ROEHR *is a free-lance reporter based in Washington, D.C.*