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EDITORIAL

Bureaucrats Save Lives

What a time to be a federal employee! In the rush to downsize government, politicians have demonized bureaucrats, reducing them from drones to vampires. Yet I and many of the scientists I know have a very different image of federal bureaucrats. My personal hero is Herman Lewis, whose administrative career at the National Science Foundation (NSF) from 1962 to 1986 earned him a reputation as an extraordinary champion of progress in science. Lewis not only brought high standards to the NSF, but also made a decision that saved millions of lives.

In 1977, my students and I devised a scheme to transform common bakers' yeast by coaxing the yeast cells to take up and replicate virtually any DNA molecule. However, at that time the government advisory body most involved in the oversight of DNA research, the Recombinant DNA Advisory Committee (RAC) of the National Institutes of Health (NIH), prohibited such experiments in yeast. Enmeshed in the hysterical national debate over the potential dangers of recombinant DNA research, the RAC was loath to move into uncharted territory. When I appealed to the RAC, I was told, "It will probably be 2 years before we can even consider such experiments in yeast."

Thwarted by the imbroglio at NIH, I sought Herman Lewis's advice. In a moment of inspiration, he said, "You have an NSF grant. The NSF is not constrained by the rules of the NIH RAC." Lewis identified a loophole that had escaped everyone else: He had the authority to approve novel ideas within the context of our peer-reviewed NSF grant. Shortly thereafter—on 26 October 1977—he officially authorized our experiments. Within a few weeks, we demonstrated that our scheme worked and opened a new avenue for drug and vaccine development. Faced with inconsistent policy between two federal agencies, the RAC voted on 9 March 1978 to permit yeast experiments. By sanctioning our experiments, Lewis had accelerated the genetic engineering of yeast by 2 years.

Lewis's decision to permit the yeast experiments led to a completely unexpected bonanza: the formulation of a safe, effective, and inexpensive vaccine against hepatitis B. This virus, carried by about 300 million people worldwide, is transmitted through blood and sexual contact. Because chronic infections can ultimately lead to cirrhosis of the liver and liver cancer, millions of those infected die. In the late 1970s, the only vaccine available was derived from human serum; it was in short supply, and those treated risked infection with other blood-borne viruses carried by the vaccine.

Using our new technique, William Rutter of the School of Medicine at the University of California, San Francisco, and Benjamin Hall of the University of Washington introduced the gene for the hepatitis B coat protein into yeast. The resulting genetically engineered yeast produced vast quantities of highly immunogenic but noninfectious virus particles, which were developed into a commercial vaccine by Merck in 1986. This vaccine is effective against hepatitis B, carries no blood-borne viruses, and is available in unlimited quantities. Without Lewis's intervention, the hepatitis B vaccine would have been delayed by 2 years and millions of lives would needlessly have been lost. Why did Lewis intervene and buck the system? In a recent letter, he summarized his motivation: "I learned that if you were a little aggressive, had confidence in your scientific judgment and exercised some imagination, you could get lots done within the system to catalyze science. I came to realize that, although talented bench scientists drive science, responsible and judicious administrators could be important factors in the driving team. I can honestly state that I genuinely, though vicariously, shared with lab scientists the excitement of a new insight or discovery that was a consequence of a decision I uniquely made. It is not exactly accurate to say that 'I was just doing my job,' but in context I believe it is acceptable shorthand."

There are many administrators like Herman Lewis who should be honored for just doing their jobs. We are fortunate, today, to have a legion of gifted public servants who possess invaluable knowledge and experience gained at the forefront of science. Ill-considered measures to discredit the bureaucracy will alienate these leaders and ultimately cost us lives.

Gerald R. Fink

The author is director of the Whitehead Institute for Biomedical Research in Cambridge, Massachusetts. E-mail address: fink@wi.mit.edu