

contract rabies in the United States. In an interview with *Science*, Kingsbury agreed there was reason to test the vaccine in Argentina where rabies is often transmitted to cattle by vampire bats.

Sponsored by PAHO, a United Nations agency, the Argentine experiment involved the inoculation of cattle with a recombinant vaccine produced by splicing a single gene from a rabies virus into vaccinia virus. The aim was to trigger an antibody response in the inoculated cattle to the protein produced by the rabies virus gene. In the test, carried out at a PAHO facility in Azul, 20 uninoculated animals were isolated in a shed with the 20 inoculated cattle. The animals' four caretakers previously had been immunized with a vaccinia virus.

Daniel Epstein, a spokesman for PAHO in Washington, says that "in retrospect it would have been advisable for us to have informed Argentine officials of the experiment, and not treat it as a routine matter." The Argentine government was not notified until after the experiment was completed.

Cheston says that because PAHO was leading the experiment, Wistar did not seek to consult with the Argentine government, which objected to the experiment being done without formal notification. "We were a little naive as I think scientists frequently are," admits Cheston. Wistar's role included designing the experiment and providing the vaccine—an effort led by Hilary Koprowski, the institute's director. PAHO personnel administered the vaccine and analyzed blood samples.

The purpose of the New Zealand experiment, in contrast, was not to test a vaccine for a specific ailment, says Alvin W. Smith, a professor at Oregon State's College of Veterinary Medicine. Rather, it was a modeling exercise designed to determine whether a recombinant vaccinia virus containing genetic material from another virus would produce an antibody response sufficient to neutralize the virus in a diseased animal.

In the New Zealand test, a gene from a common animal virus, Sindbis, was inserted into the vaccinia. Some 37 calves, 16 chickens, and 4 sheep were involved. Serum samples from the control groups did not reflect any transmission of the recombinant vaccinia virus from inoculated animals. The experiment was conducted by Smith's colleague at Oregon State, Edward Wedman, who worked with researchers in New Zealand. Wedman also got approval to use U.S. Department of Agriculture (USDA) research funds in the experiment, which may lead to production of a vaccine to combat foot rot in sheep.

As for Smith and Wedman's decision to conduct their test in New Zealand, Smith

says that 18 months ago there was no telling how long USDA would take to okay the experiment. James Glosser of the Animal and Plant Health Inspection Service says that the test might have gotten approved

quickly given the nature of the undertaking. Smith says that if he were starting today, he would try to conduct the test in the United States because the regulatory process has improved. ■ **MARK CRAWFORD**

Harvard Researchers Retract Data in Immunology Paper

Last spring, researchers from Harvard's Dana-Farber Cancer Institute reported the discovery of a potentially exciting new molecule that appeared to amplify the vital T-cell activities that are necessary for many immune responses (*Science*, 7 March, p. 1118). In a letter in this issue (p. 1056), they are retracting that paper. The molecule, a lymphokine called interleukin-4A (IL-4A), is not real.

"The data are not reproducible," senior author Ellis L. Reinherz told News & Comment. "We need to set the record straight so no one tries to characterize a molecule that doesn't exist." The data apparently were tampered with. The extent of the problem is being investigated by an ad hoc committee of scientists from the Dana-Farber and Harvard Medical School.

The *Science* paper was coauthored by Neil E. Richardson, a graduate student, and Claudio Milanese, a Ph.D. from Turin, who was working in Reinherz's laboratory but has recently returned to Italy. A six-author paper on IL-4A published in the *Journal of Experimental Medicine* is also being retracted. Unpublished manuscripts have been withdrawn from *Science* and the *Proceedings of the National Academy of Sciences*.

IL-4A was reported to be a novel "lymphokine" that stimulates resting lymphocytes. (Lymphokines are any of the various factors involved in stimulating the growth or development of immune cells. Perhaps the most well known of this class of substances is interleukin-2, which is being used experimentally in patients with cancer and with AIDS.) In their *Science* paper, the authors reported that IL-4A induces interleukin-2 receptors.

Problems with the IL-4A data came to light only within the past several weeks when researchers in Reinherz's lab were unable to continue IL-4A experiments after Milanese's return to Italy. When no technical problems were found to explain why the experiments were suddenly failing to work, Milanese, who had been doing the biological assays, was asked to come back to Boston to help figure things out.

Shortly thereafter, it was decided that a full review of the situation was called for. Baruj Benacerraf, president of the Dana-Farber, acted promptly to establish a committee and to notify appropriate officials at Harvard and at the National Institutes of Health, which was funding the research. Notification of NIH is now required in cases in which scientific misconduct has been alleged. Mary Miers of NIH told *Science* that Harvard has submitted a "well-defined" plan for investigating the case.

According to Benacerraf, Milanese has "admitted" that the data are not valid in a letter to Reinherz "which is in our possession." Even so, Benacerraf says, "I don't take that as proof until our committee has reviewed everything."

In a telephone interview from Italy, Milanese acknowledged writing to Reinherz to admit he manipulated data. In reference to IL-4A he said that at first "I thought it was true. Then the cells stopped producing. There was a lot of pressure in the lab and I didn't have the courage to tell them." The problems apply only to the IL-4A research, Milanese told *Science* in reply to a question.

Reinherz and others decline to discuss the case in any detail, pending the outcome of the investigation, which is being headed by Stuart Schlossman of the Farber. David Kiszka, research director of the institute, says the committee will "look into the circumstances leading to the retractions. We don't want to say something now that isn't the full truth." Kiszka predicts that "If the story is a fairly simple one, we'll probably be able to wrap this up in a few weeks, perhaps a couple of months." Meanwhile, says Benacerraf regarding the immediate retraction of the IL-4A data, "The scientific record has to be corrected quickly." ■

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