

Report condemns NIH role in AIDS trials

U.S. and French scientists involved in testing an experimental AIDS vaccine failed to receive proper U.S. government approval and to adequately warn their human volunteers of the risks involved in participating in the vaccine's trial, according to a preliminary National Institutes of Health (NIH) report obtained this week. Moreover, the report asserts that the 10-month investigation reveals "a general failure on the part of the NIH . . . to provide adequate protection for human research subjects."

NIH director Bernadine Healy responded to the internal report last month by directing all NIH research chiefs to submit a list outlining the ethical guidelines used in their studies with human patients. The NIH office that oversees the safety of NIH research has also set a Sept. 13 deadline for Healy to outline an overhaul of NIH procedures for protecting human volunteers.

The new report also recommended additional "minimal actions," including ethics courses for NIH scientists and their collaborators, and the development of standardized written agreements for the sharing of biological materials.

The NIH Office of Protection from Research Risks began the investigation following allegations by Chicago Tribune reporter John Crewdson that French AIDS vaccine trials performed with the aid of U.S. researchers did not conform to federal ethics guidelines. Three out of 57 Zairian volunteers died during a mid-1980s trial of a vaccine made from a genetically engineered AIDS virus. Daniel Zagury at the University of Pierre and Marie Curie in Paris developed the vaccine with help from NIH researchers Robert C. Gallo — the co-discoverer of HIV, the AIDS virus — Bernard Moss and Takis Papas.

NIH regulations that govern the use of humans in research apply not only to studies conducted in the United States but also to those performed in other countries with the assistance of NIH scientists. According to the new report, Zagury and Gallo exhibited "a continuing lack of understanding" of the NIH human subjects regulations.

The report describes nine human-AIDS-vaccine projects that Zagury conducted in France or Zaire. Three projects tested a vaccine that was approved in the United States only for experimental use in animals, the report states; one involved 18 Zairian children. Three other trials analyzed blood samples from patients without first obtaining their informed consent. A seventh project involved some patients taking AZT — even though NIH had not approved a protocol to include such patients. In an eighth study, patients were immunized with pieces of HIV without first being told that they would subsequently test positive on

blood tests for AIDS — despite never having been infected by the virus.

"NIH must be faulted for creating an administrative structure (or vacuum) that has resulted in widespread confusion" about ethical procedures for human subjects, the report states. The NIH scientists "assumed that they had no responsibilities in this area as long as they did not directly inject human beings with experimental materials," the report adds.

Gallo and NIH officials involved in the preparation of the report could not be reached for comment.

NIH is still trying to determine if the breaches of biomedical ethics resulted in harm to any of the studies' participants, according to the report. Because Zagury has refused to share medical records for his studies' volunteers, NIH officials are currently attempting to gain access to the records through diplomatic channels.

Zagury contends the vaccine trials were conducted according to the ethical guidelines of France and Zaire, and that except for the three who died, all of the volunteers remain healthy. He describes as "crazy" NIH's request to send experts to France and Zaire to monitor his patients' medical records. "Do you think French experts would go to NIH to look for American records?," he asks rhetori-

cally. "This is something unbelievable."

French law does not require researchers to gain patients' consent before analyzing their sampled blood, Zagury says. He also denies giving humans any vaccines not approved for human testing. "Of course reagents were not used in humans when it was specified not to use them in humans," he asserts.

In addition, Zagury contends that Gallo, Moss and Papas were not collaborators on his vaccine trials. Therefore, he argues, NIH's ethics rules do not apply. "I deny categorically that NIH scientists were involved" in the tests in France and Zaire, he told *SCIENCE NEWS*. "NIH scientists had no involvement in terms of budgetary participation, research program participation or clinical investigation that might have constituted a scientific collaboration," he asserts. But he acknowledges that NIH researchers provided "intellectual consultations."

The NIH report says Zagury's studies "relied, at least in part, on materials and/or technical expertise provided by NIH scientists."

Midway into the NIH investigation, the agency forbade Gallo from further collaborations with Zagury. NIH director Healy has now forbidden Gallo, Moss and Papas or members of their laboratories from participating in any research projects involving human subjects without special dispensation from NIH. — C. Ezzell

Messages in mathematically scrambled waves

When White House chief of staff John H. Sununu travels, he has with him special equipment to scramble telephone calls and keep communications secure from eavesdroppers. This kind of sophisticated, expensive technology for assuring privacy, however, generally lies beyond the reach of someone who merely wants to keep neighbors from inadvertently listening to or deliberately intercepting conversations over a cellular or portable telephone.

"There are only a few cases where you want to use the best [technology available]," says mathematician and cryptography expert G.R. Blakley of Texas A&M University in College Station. "Just as we put locks on sliding glass doors, we want to be able to enclose certain [information] in envelopes that are relatively inexpensive and keep out casual browsers."

Blakley is one of a small group of computer scientists and mathematicians now exploring the applicability of several mathematical techniques for scrambling analog information — such as a telephone conversation or a television signal — which is represented as a continuous wave rather than digitally as a sequence of numbers. "We're trying to build up a zoo of mathematical choices so that . . . people can search among them to find

things that are both reasonably secure and cost-effective to implement," he says.

Blakley and several other speakers described recent developments in analog cryptography at the International Conference on Industrial and Applied Mathematics, which convened last week in Washington, D.C.

Practically all present-day cryptographic systems for hiding information depend on having signals in a digital form. Scrambling a telephone conversation, for example, requires converting speech into a digital signal, which is then mathematically manipulated to produce the encrypted message.

One possible way to simplify the whole procedure involves working directly with the continuous wave itself, circumventing the time-consuming and costly process of converting the analog signal into a digital form. But finding the right set of mathematical manipulations that not only effectively hide information, but also permit their easy unraveling by a receiver, remains a challenge.

Computer scientist George I. Davida and mathematician Gilbert G. Walter of the University of Wisconsin-Milwaukee have studied several candidates for an analog cryptographic system that would provide a reasonable level of security. One scheme requires applying a so-