The NIH Record

U.S. Department of Health and Human Services

May 8
1984
Vol. XXXVI
No. 10

National Institutes of Health

Dr. John Gallin Presented Clinical Research Award

Dr. Gallin

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NCI Scientists Identify New Virus As Highly Probable Cause of AIDS

A science team at the National Cancer Institute, led by Dr. Robert C. Gallo Jr., has uncovered strong evidence that variants of a human cancer virus—called HTLV-III—are the primary cause of acquired immune deficiency syndrome (AIDS).

Though the discovery won't yield an immediate treatment for those who already have AIDS, it makes possible a simple test to screen blood donated to blood banks or sent to diagnostic labs and eventually may produce a vaccine against AIDS.

It may also lead to some type of medical intervention during the pre-AIDS phase which would prevent development of the full-blown, usually lethal disease.

Dr. Gallo and Assistant Secretary for Health, Dr. Edward N. Brandt Jr., both estimated it would be 2 to 3 years before any vaccine would be ready for testing and emphasized this was only a guess.

Dr. Gallo, chief of the Laboratory of Tumor Cell Biology in NCI's Division of Cancer Treatment, reported isolation of the new group of viruses. They are variants of a family of viruses known as human T-cell leukemia/lymphoma virus (HTLV).

Dr. Gallo

The scientists isolated the new HTLV-III viruses from the helper T-cells of more than 50 patients with AIDS or pre-AIDS symptoms, and from some healthy individuals at risk of developing AIDS.

About 90 percent of AIDS patients tested so far have high levels of antibody to the virus (an indicator of infection). Similar results have been found in patients with pre-AIDS, such as the lymphadenopathy syndrome.

Normal people who are not at high risk of developing AIDS have very low levels or none.

Four papers published by Dr. Gallo and his coworkers in the May 4 issue of *Science* document the scientists' ability to isolate the HTLV-III viruses from infected persons; the development of a method for growing the viruses in T-cells in the laboratory in bulk amounts; the biochemical and immunological characterization of proteins and genes of the viruses; and the presence of viral antibodies in blood samples of infected people.

"Although this evidence does not prove absolutely that these viruses cause AIDS," said NCI Director Dr. Vincent T. DeVita Jr., "it is very strong evidence that we have isolated the causative agent. Short of preventing the disease with a vaccine, we may find no better proof."

The NCI effort was set up as a coordinated AIDS task force headed by Dr. Peter J. Fischinger, NCI associate director, with Drs. Gallo and Samuel Broder as the scientific and clinical directors of this research. Scientists from other HHS agencies and the extramural community were regularly involved.

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NIH Proposal on Animal Welfare Policy Tightens Some Rules, Clarifies Others

The National Institutes of Health has proposed a revision of the Public Health Service animal welfare policy that is a refinement of, and in some instances stricter than, the current policy.

Since almost half of NIH research projects supported through grants and contracts involve the use of animals—most of them rodents—the revised policy could have a broad impact on the biomedical research community.

Dr. William F. Raub, NIH Deputy Director for Extramural Research and Training, discussed NIH's rationale for the revision and outlined some of the changes at the recent national symposium on "Imperatives in Research: Scientific Needs and Animal Welfare."

He covered five major areas that differ from current policy:

• *Greater specification of responsibilities within the awardee institution.* The revision speaks more clearly than the current policy on the responsibility of "a senior official" at the local institution signing off and committing the institution to certain activities and associated requirements. It also broadens the role of the attending veterinarian and goes into considerable detail about the institution's animal research committee.

• *Changes in the role of the NIH Guide for the Care and Use of Laboratory Animals regarding the requirements of grants and contracts.* The revision distinguishes between the few requirements in the *NIH Guide* and its many recommendations. In addition, the proposed policy states that acceptance of the "Principles of the Care and Use of Laboratory Animals" would be "mandatory," and not just recommended as in the current policy. (The "Principles" are included in the appendix of the current *NIH Guide*.)

• *Types of Assurance.* Awardee institutions would have a choice of two ways to comply with the proposed policy: full accreditation by the American Association for the Accreditation of Laboratory Animal Care (AAALAC), a national nonprofit organization with a well-established inspection and accrediting system, or an assurance based on self-assessment.

The self-assessment option would be more specific (than stated in the current policy) in providing NIH with details and results of self-assessment and an annual report on progress toward correction of deficiencies. Institutions choosing the self-assessment option also would be subject to random selection for site visits by NIH.

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Gallo Team Finds AIDS Virus

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Dr. Gallo's laboratory together with clinicians and scientists from the NCI Immunology Branch, Memorial Sloan-Kettering Cancer Center, Duke University, the University of North Carolina, North Shore University Hospital on Long Island, Walter Reed Army Institute of Research in Washington, D.C., the University of Medicine and Dentistry of New Jersey in Newark, and New England Deaconess Hospital in Boston were able to isolate the HTLV-III viruses by finding human T-cells that grow well in the laboratory and are especially permissive for infection by these viruses.

This discovery made possible the isolation of proteins made by the viruses from these cells. Enough viral protein was produced to test selected blood samples for the presence of antibody to the viruses. As a result, the scientists were able to devise a simple laboratory test that diagnoses the presence of HTLV-III antibodies in blood.

NCI scientists predict that within 6 months it will be possible to produce the amounts of viral protein needed for large-scale screening of blood samples by blood banks and diagnostic laboratories. Rapid tests for antibodies to HTLV-III in human blood are already feasible.

Scientists at the NCI Frederick Cancer Research Facility are collaborating with Dr. Gallo's group to develop procedures for large-scale production of these proteins.

NCI scientists also believe it will be possible to develop new ideas for treatment and a vaccine for AIDS.

These scientists are now exploring the detailed biochemical and immunological characteristics of the new HTLV-III viruses, which infect helper T-cells preferentially.

Their lethal effect on T-cells is unusual for the HTLV viruses. Together with detectable differences in some of their proteins and genetic information, their ability to kill T-cells clearly separates these viruses from other members of the HTLV family.

The virus isolated by the NCI scientists is a member of a family of retroviruses, which have been studied extensively in animals. The genetic material in these viruses is ribonucleic acid (RNA).

AIDS is an often fatal disease characterized by a severe loss of natural immunity that predisposes the patient to severe opportunistic infections and other disorders. These include Pneumocystic carinii pneumonia and Kaposi's sarcoma, a rare cancer that starts in cells of blood vessel walls. It occurs predominately among homosexual men with multiple sexual partners, intravenous drug abusers, hemophiliacs, blood transfusion recipients, and close heterosexual contacts of members of these high-risk groups. The severe immune deficiency in patients with AIDS is caused by destruction of immune system cells in the blood called helper T-cells.

The retroviruses are named for their ability to convert RNA into deoxyribonucleic acid (DNA), the hereditary chemical comprising the genes of human and animal cells.

In so doing, these viruses use the genetic machinery of the cells they infect to make the proteins they need to survive. In the process, many retroviruses cause a variety of ailments in animals, including depressed immune functions and cancer.

The first member of the HTLV family of viruses, HTLV-I, was isolated in 1978 and first published in 1980, also by Dr. Gallo and his coworkers. It has been re-isolated many times since then in this country and abroad from a form of leukemia and lymphoma that affects mature T-cells.

Extensive epidemiologic studies have linked HTLV-I to clusters of these cancers in certain parts of the world, particularly southern Japan, the Caribbean, and parts of South America and Africa.

A related virus, called HTLV-II, rarely isolated, originally taken from a patient with a hairy cell leukemia by Dr. Gallo and his group in collaboration with UCLA scientists.

Dr. Gallo and his collaborators first reported biochemical evidence, and Dr. Max Essex and other scientists from the Harvard School of Public Health and the Centers for Disease Control reported immunological evidence, for an association between HTLV or a variant of it with AIDS in the May 12, 1983, issue of *Science*. □

PRAT Pharmacology Lecture Slated at ACRF on May 9

The Pharmacology Research Associate Program of the National Institute of General Medical Sciences will sponsor a lecture for its fellows, their preceptors, and all interested NIH staff on Wednesday, May 9, at 9:30 a.m. in the ACRF amphitheater.

"Of Toxicity and Panacea, of Cabbages and Kings" is the title of the talk to be delivered by Dr. Sidney Nelson, associate professor of medicinal chemistry, school of pharmacy, University of Washington, Seattle.

After obtaining his Ph.D from the University of California, San Francisco, Dr. Nelson was a PRAT fellow from 1974 to 1976 under Dr. James Gillette, chief of the Laboratory of Chemical Pharmacology, National Heart, Lung, and Blood Institute.

He is the recipient of two prestigious awards—the John J. Abel Award of the American Society for Pharmacology and Experimental Therapeutics in 1981, and the Frank Blood Award in Toxicology (co-recipient) in 1983.

Following the lecture, the 22 current PRAT fellows will present informal poster sessions on the research they are conducting. The poster session will take place adjacent to the NIH Visitors Center.

The PRAT Program offers 2 years of postdoctoral research training in pharmacology within the intramural laboratories of NIH and the Alcohol, Drug Abuse, and Mental Health Administration for outstanding individuals with backgrounds in clinical medicine or basic sciences. □

U.S. GOVERNMENT PRINTING OFFICE 1984—421-134/17