# AIDS: New Viruses to Fill in the Blanks

Two new members were proposed last week for the AIDS group of viruses. One apparently causes AIDS, while the other appears harmless to humans and may even protect against AIDS. According to the researchers, the findings bring possibilities for prevention as well as for understanding the origin of the disease.

One of the newly identified variants, named human T-lymphotropic virus type IV (HTLV-IV), was first isolated in healthy prostitutes in Senegal. Max Essex of the Harvard School of Public Health in Boston, who headed the team that discovered the virus as well as a similar strain in African green monkeys, says the virus may be a "missing link" between the monkey and human viruses.

The devastating effect of the AIDS virus may be due in part to its youth: Human bodies have yet to evolve defenses against it. But the origin of the disease has been a mystery. Serum samples drawn from Africans in the mid-1970s and tested in the last few years show signs of the virus, or of a closely related one, and retrospective diagnoses of AIDS have been made for a few Africans who came to Europe for treatment at about that time.

Essex postulated last year (SN: 4/20/85, p. 245) that the AIDS virus made its way into Africans who ate or were bitten by primates infected with a closely related virus, but the idea has met with hostility from Africans who feel unjustly burdened with responsibility for the epidemic.

HTLV-IV is closely related to the AIDS virus: Some antibodies made in response to one virus recognize and cross-react with particles from the other, and the viruses home in on the same target in the body, a T cell subgroup of the immune system. But while the AIDS virus is lethal, people infected with HTLV-IV remain healthy. The team has followed more than 50 infected Senegalese for up to three years, and has found no signs of virus-caused illness, including AIDS. In fact, there has been only one reported case of AIDS in the entire country. "You have to wonder why [AIDS] is in neighboring countries and not there [in Senegal]," says Phyllis Kanki of the Harvard School of Public Health. And there is no evidence of asymptomatic infection with the AIDS virus in Senegal, Essex says, though "to our knowledge, HTLV-III/LAV [the AIDS virus] is present in Dakar, Senegal, where we did our study."

All this could mean, Essex suggests, that HTLV-IV affords natural protection against AIDS. At the least, the variant could serve as a natural laboratory for scientists studying the disease process in AIDS. "We feel that what we might have is a naturally attenuated variant in this general family [of human T-lymphotropic viruses]," Essex says. "It doesn't seem to be killing the same cells, although it infects them. . . . So we should be able to learn a lot about how people can be protected against disease development after infection with a virus of this general type."

The new findings have rekindled long-simmering competition among scientists in this area. Essex's decision to announce his findings two weeks before their scheduled publication in the April 11 SCIENCE appeared to be prompted by the release the day before of new, unpublished AIDS findings by a European team. According to Luc Montagnier of the Institut Pasteur in Paris, his team has isolated a previously unidentified AIDS-causing virus in two patients in European hospitals. Montagnier's group was the first to isolate a virus associated with AIDS, which he called LAV, for lymphadenopathy-associated virus. He has named his new variant LAV-II.

While LAV-II is no cause for optimism, HTLV-IV might bring researchers closer to an AIDS vaccine. It is "totally impossible," Essex says, to use HTLV-IV itself as a vaccine, since it sets up a persistent infection of unknown outcome. But it may be helpful because it shares many antigens with the AIDS virus — most significantly, perhaps, some surface antigens that are likely candidates as the viral part that recognizes the T cell target. "I think that taking parts of this virus, to see whether or not they would be effective as a vaccine, is certainly appropriate," says Essex.

These are not likely to be the only variants found. "We predict that there will be other viruses in the spectrum that range from the African green monkey prototype . . . through to the HTLV-III/LAV-type virus as we know it," says Essex. "It's quite generally understood that this family of viruses has a very sloppy means of replication and therefore a very high rate of mutation." — *L. Davis*

## Child health: Prospects looking good

The attempt to provide worldwide immunization against six childhood diseases by 1990 is right on track, according to a report released this week by a task force sponsored by the World Health Organization (WHO), the World Bank, the Rockefeller Foundation and the United Nations. The goal, initially set by WHO in 1978, is to save the lives of the 3.5 million children each year who die from measles, whooping cough, tetanus, diphtheria, polio or tuberculosis.

Recent scientific advances may soon bring several other infectious diseases under control as well, Kenneth S. Warren of the New York-based Rockefeller Foundation said at a press conference marking the release of the report.

William H. Foege, head of the task force and former head of the Centers for Disease Control in Atlanta, said the optimism was warranted by the successful eradication of smallpox, newly instituted immunization programs in several Third World countries and medical advances such as the development of a measles vaccine that remains potent without refrigeration. Deaths from the diseases have already dropped from an annual rate of 5 million children five years ago to the current, estimated 3.5 million.

Unlike smallpox, some of the diseases will never be completely eradicated because the pathogens can survive outside of sick people; but control, Foege says, is clearly possible.

The cost of control is $5 per child, or about $1 billion a year — "half the price this country spends on cigarette advertising," Foege says.

According to Warren, other infectious diseases, including malaria, may soon be preventable. Warren says there could be as many as 50 vaccines available in the next 20 years.

The new vaccines, he predicts, will be a result of two scientific advances — the ability to genetically engineer bacteria to produce proteins, or bits of proteins, that can be used as vaccines, and the development of vectors, genetically engineered organisms that produce immunity-provoking factors within the body.

Vaccinia, a harmless virus similar to smallpox, was responsible for eradicating that disease. Recently scientists have discovered how to saddle vaccinia with genes from other pathogens, so that the vaccinia will immunize against those diseases (SN: 6/15/85, p. 379). Human trials with a typhoid bacterium carrying genes from a diarrhea-producing bacterium have already begun, Warren notes, and it is likely that other genes can be hooked into the orally taken typhoid vaccine as well. "The rate of development," he says, "is mind-boggling." — *J. Silberner*