AIDS vaccine revs up the attack on HIV

A very preliminary study hints that an experimental vaccine may slow the development of AIDS in people who have been infected with the virus but who show no symptoms of the disease. The investigators say their early data suggest that such post-infection treatment may boost the body's defense against the tricky virus, known as HIV. At the same time, they emphasize the need for more extensive testing to prove the efficacy and safety of this approach.

The body naturally responds to HIV infection by mounting a fierce immune defense, a battle that can sometimes ward off disease symptoms for years. In most patients, however, the virus eventually wins the struggle. As HIV decimates the immune system, it opens the door to a panoply of potentially deadly "opportunistic" infections, including an otherwise rare form of pneumonia.

With the World Health Organization estimating that HIV may infect about 40 million people by the year 2000, researchers are racing to find a vaccine. Earlier this year, scientists reported spurring an immune response in healthy, uninfected volunteers by injecting the experimental vaccine known as gp 160, a genetically engineered replica of a surface protein found on the AIDS virus. Other studies in chimps and humans have led researchers to suggest that such vaccines might also offer an effective treatment for individuals already infected with HIV.

Now, a team led by Robert R. Redfield of the Walter Reed Army Institute of Research in Rockville, Md., reports preliminary evidence that gp 160 may indeed help mitigate HIV's relentless attack on the immune system. The study, described in the June 13 NEW ENGLAND JOURNAL OF MEDICINE, involved 26 men and 4 women with asymptomatic HIV infection. Each volunteer received three to six intramuscular injections of gp 160 over a period of 120 to 180 days.

Ten months after the study's start, 19 of the 30 participants showed a more vigorous immune response to the virus, including HIV-specific antibodies not normally produced by people with the infection. In addition, these 19 showed signs of increased white-cell activity, and some produced specialized white cells that destroy HIV-infected cells.

During the study, the 19 vaccine responders showed no decline in blood levels of CD4 T-lymphocytes – white cells targeted by HIV and commonly used by researchers as a gauge of the infection's progression. In the 11 people who did not respond to the vaccine, CD4 blood levels dropped 7.3 percent – a decline similar to that seen in asymptomatic, HIV-infected people who don't get treatment, Redfield and his co-workers note.

The investigators admit they don't know whether these laboratory indicators of a more aggressive immune response will translate into a better quality of life for HIV-infected individuals. Nonetheless, study coauthor Franklin Volvovitz calls the new data "exciting." If further research confirms these findings, regular booster shots of gp 160 might help keep HIV-infected people free of opportunistic infections for years, says Volvovitz, president of MicroGeneSys, Inc., in Meriden, Conn., the firm that developed the vaccine.

Anthony S. Fauci, director of the National Institute of Allergy and Infectious Diseases (NIAID) in Bethesda, Md., cautions against jumping to conclusions regarding the vaccine's efficacy. "Certainly, there's a tantalizing suggestion that CD4 cells stabilized," he told SCIENCE NEWS. But, he adds, "it's still far too early in the clinical trial stage to make any comment about whether this immune response in fact will turn out to ultimately be relevant."

Moreover, Redfield's team has yet to demonstrate the vaccine's long-term safety, Fauci says, noting concerns that such a treatment might somehow exacerbate the HIV infection over time. In the preliminary study, which focused on safety, most volunteers reported mild reactions localized in the skin around the injection site, but no serious vaccine-related effects. MicroGeneSys plans another study of gp 160, this one designed to test both efficacy and safety.

Other research teams have embarked on similar quests for post-infection vaccines that could hold off or even reverse HIV-induced damage to the immune system, says Wayne C. Koff of NIAID. In the meantime, Koff advises people with HIV infection to view all preliminary findings – including this week's report – with some skepticism. – *K.A. Fackelmann*

Conserving a coyote in wolf's clothing?

Conservationists who seek to preserve the North American red wolf as a unique species may be barking up the wrong tree. For decades, the red wolf has been nearly indistinguishable genetically from either the gray wolf or the coyote, report two population geneticists who have compared DNA "fingerprints" from captive red wolves with those from frozen blood samples and museum skins.

The finding is expected to fuel the debate over whether the red wolf is a separate species – eligible for conservation under the Endangered Species Act – or a hybrid resulting from years of cross-breeding between overlapping populations of gray wolves and coyotes. In general, such hybrids are excluded from protection under the conservation law.

The red wolf became extinct in the wild in 1975, falling prey to systematic hunting and human encroachment into its habitat in the southeastern United States. But just before the last of the red wolves died off, ecologists rounded up several mating pairs and used them to found a captive breeding colony sponsored under the Endangered Species Act. The breeding program has released 25 of its 170 live red wolves into protected areas in North Carolina and on several southeastern coastal islands.

To probe the red wolf's ancestry, Robert K. Wayne of the University of California, Los Angeles, and Susan M. Jenks of the University of California, San Francisco, analyzed mitochondrial DNA samples from the captive colony. Because DNA in the mitochondria – the cell's energy-producing organelles – mutates more rapidly than DNA in the nucleus, Wayne and Jenks hoped it would provide a clearer picture of the animal's heritage.

The researchers chopped up mitochondrial DNA taken from the captive red wolves and sorted the pieces on a gel slab according to their size. The fragments formed a characteristic pattern, or DNA fingerprint, identical to that of coyote mitochondrial DNA.

"We were somewhat disappointed," says Wayne, now head of conservation biology for the Zoological Society of London. "We were hoping to find a unique red wolf [gene pattern]."

He and Jenks then turned to frozen samples of blood drawn from 32 wild red wolves before the extinction. More than 80 percent of the samples yielded mitochondrial DNA identical to that of coyotes, and the rest proved identical to gray wolves.

Finally, the researchers examined mitochondrial DNA extracted from six pelts collected from red wolves between 1905 and 1930. All the pelts' DNA fingerprints matched those of either gray wolves or coyotes.

Jenks (now at the University of California, Berkeley) and Wayne report in the June 13 NATURE that their results could support either of two conclusions: that the red wolf is a true hybrid, or that it picked up the genetic similarities sometime in the distant past when its diminishing numbers caused it to mate with gray wolves or coyotes out of desperation.

Either way, Wayne contends that the red wolf should continue to be conserved. "No matter what it was – hybrid or separate species – what is being bred today in the captive colony is representative of what was in the wild," he argues. "In that sense, we ought to preserve it."

Doug Inkley, an ecologist with the National Wildlife Federation in Washington,