AIDS: Waiting for cure or treatment

Laboratories across the United States and Europe are searching for and finding drugs that combat the AIDS virus. But meanwhile the virus is demonstrating features that can complicate drug treatment and that will have to be overcome if the U.S. Public Health Service is to meet its goal of controlling and preventing AIDS by the year 2000.

At last week's Interscience Conference on Antimicrobial Agents and Chemotherapy (ICAAC) in Minneapolis, researchers from Burroughs Wellcome Co. in Research Triangle Park, N.C., revealed details about azidothymidine (AZT), which was synthesized by chemists there last year. After the drug halted replication of the AIDS virus in cells growing in test tubes, researchers at the National Cancer Institute (NCI) in Bethesda, Md., and Duke University in Durham, N.C., began testing it in humans.

AZT has thus far been given to 10 men with AIDS or AIDS-related complex (ARC), says Sandra Nusinoff-Lehrman of Burroughs Wellcome and Duke. It is too early to tell if the drug is beneficial. As far as safety, she says, "It appears as though we're not having any unpleasant surprises." If no toxicity problems are seen, more extensive trials to establish efficacy will begin in early 1986. "We have every hope that it will be an important drug in the treatment of AIDS," says Nusinoff-Lehrman.

The drug appears to block the action of reverse transcriptase, an enzyme specifically needed by retroviruses such as the AIDS virus to permit incorporation into a host cell's DNA. Nusinoff-Lehrman would like to be able to administer the compound before the immune system has been extensively damaged by the virus.

The question of when to treat is a crucial one, since many more people have been infected with the virus than have the disease. For example, 31 men who are part of a long-term study in San Francisco have been infected with the AIDS virus for five years or more; 21 of them remain healthy, according to a report in the Sept. 27 Morbidity and Mortality Weekly Report. At the ICAAC meeting, Martin S. Hirsch, who is involved in several AIDS trials at the Massachusetts General Hospital in Boston, remarked, "The earlier in the course of the infection that you treat, the more likely the benefit. But with potentially toxic drugs, it's hard to use them without a known benefit."

There are other barriers to treatment. Following up on earlier reports of the AIDS virus in central nervous system tissue, David D. Ho and his colleagues at Mass. General found the virus in the central nervous system tissue of 24 of 45 patients with AIDS or ARC.

The virus may be getting in through the same cell portal. Candace Pert of the National Institute of Mental Health in Bethesda, Md., and William Farrar and Frank Ruscetti of NCI have found the same protein receptors on the surface of brain cells as the AIDS virus uses to latch onto immune system cells, Pert told Science News this week.

The presence of the virus in the nervous system means that AIDS drugs will have to cross the blood-brain barrier to wipe out virus reservoirs, says Ho. Hirsch, who worked with Ho on the project and is currently testing interferon against AIDS, notes that interferons don't cross the barrier very well. Nusinoff-Lehrman says spinal fluid studies show that AZT may penetrate the barrier.

Of the drugs now being tested against AIDS, says Hirsch, "None has shown a benefit against AIDS in patients. Some have shown they might inhibit the virus [in patients] as they do in the lab. All are in need of large-scale clinical trials."

And then there's the matter of a vaccine, which requires stimulating the production of antibodies capable of fighting the virus. Gerald V. Quinnan and his colleagues at the Food and Drug Administration in Bethesda, Md., looked at the presence of neutralizing antibodies in patients with AIDS and ARC, and found no apparent effect on the disease.

Does this mean that neutralizing antibodies don't protect? "It means once you have an established infection, low levels of neutralizing antibodies don't determine the outcome," says Quinnan. "It's still possible that neutralizing antibodies could prevent somebody from becoming infected. It's an open question."

While "there has been plenty of money" available for AIDS research, says Hirsch, more is needed to test new drugs. Last week the Senate appropriations committee upped the $120 million for AIDS research in President Reagan's fiscal year 1986 budget to $241 million; the appropriations bill that includes this sum now goes to the full Senate vote. —*J. Silberner*

TMI-1 restart underway

Concern over events that contributed to the March 1979 Three Mile Island (TMI) Unit 2 accident quickly cast doubts about whether its undamaged twin, Unit 1, could be operated safely. So that plant—shut down at the time of the accident for a routine refueling — was forced to remain idle. As the undamaged plant's safety was studied, debated, questioned in court and appealed, TMI-1 kept silent watch over its crippled twin. That vigil ended last week.

On Oct. 2, the Supreme Court's refusal to block TMI-1's restart effectively ended the appeals process (SN: 9/7/85, p. 150). At 1:30 p.m. the next day, the plant's reactor "went critical," sustaining a controlled nuclear chain reaction. Low-power testing of the plant ended two days later. For the next three months, operators will run a battery of tests as they slowly bring the plant to full power.

But most important for the Parsippany, N.J.-based General Public Utilities (GPU) Corp., owner of the plant, TMI-1 may be back in the utility's rate-paying base within three weeks. According to Gordon Tomb, a plant spokesperson at the Three Mile Island nuclear station, it's an event GPU awaits anxiously, since buying replacement power to cover the electrical demand not met by the idled plant has—over the last six and one half years — increased the utility's costs by an estimated $1.09 billion. □

Radial keratotomy: An unkind cut?

Surgery promising the nearsighted a life free from eyeglasses or contact lenses could lead to farsightedness, fluctuating vision or weakened corneas more susceptible to infection, according to some researchers. The controversial surgical technique called radial keratotomy received some hard knocks last week during a report at the American Academy of Ophthalmology's annual meeting in San Francisco.

First performed in the United States in 1978, radial keratotomy is designed to correct vision by changing the shape of the cornea using spokelike incisions (SN: 11/29/80, p. 347). But George Waring, head of a federally funded, nine-year evaluation of the procedure, told those attending the meeting that two years after surgery one-third of the 435 patients studied still suffered from vision changes. "A major problem is a progressive instability of the vision [because] a cornea has no blood vessels and heals very slowly, sometimes taking four to five years," he told Science News in a telephone interview.

Waring, a professor of ophthalmology at Emory University in Atlanta, said as the cornea heals it changes shape, altering a patient's vision. For one out of every four patients, vision in the patient's two eyes differed. Three patients in the study also developed corneal infections. Waring acknowledged there was concern that weakened corneas may lead to long-range problems if there were accidential blows to the eye or if additional surgery such as cataract operations became necessary.

On the plus side, 66 percent of the patients in the study showed what Waring considered a "generally satisfactory and acceptible outcome," no longer needing glasses or contacts.

"Those with less nearsightedness had a better outcome," Waring said. "But the problem is we can't predict the outcome for each patient." He emphasized the patient has to take a "buyer-beware attitude," referring to advertising campaigns lauding the procedure. —*D.D. Edwards*