RANDOM SAMPLES

edited by CONSTANCE HOLDEN

Confirmation for Combination AIDS Therapy

An AIDS therapy trial combining AZT with a second antiviral drug has proved so successful that it has been halted after 3 years—7 months early, researchers announced last week at the Fifth European Conference on Clinical Aspects and Treatment of HIV Infection in Copenhagen, Denmark.

The 3000-patient, multicenter "Delta" trial, conducted by investigators in Europe, Australia, and the United Kingdom, has found that combining AZT with other drugs that inhibit the HIV reverse transcriptase enzyme—ddI (dideoxyinosine) or ddC (zalcitabine)—delays both illness and death. But so far, the regimen only seems to work in patients who have not previously received AZT, possibly because AZT-treated patients have already developed some AZT-resistant HIV strains.

"It's an important result. ... It confirms the benefit of combination therapy," says Scott Hammer of Harvard Medical School, co-chair of the AIDS Clinical Trial Group 175 trial, which reported last month that AZT plus ddC delayed the progress of the disease and death in AZT-naive patients. In that group, AZT plus ddI did not significantly improve survival.

The Delta trial takes the matter "a step further," says Hammer, with more and later stage patients than the 175 trial. It found that while 17% of the AZT-naive patient taking only AZT died during the trial, only 10% of those on AZT+ddI and 12% on AZT+ddC died, representing a 38% drop in mortality.

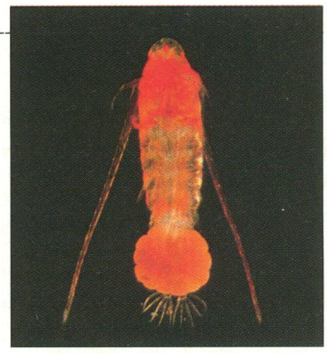
The results of the two trials will eventually be pooled with others, yet to be released, from a third large-scale combination drug study, the Minneapolis-centered "Nucombo" trial. All three trial teams have collaborated over the past 2 years to ensure compatibility.

Tim Peto, a Delta organizer and infectious-disease specialist at the John Radcliffe Hospital in Oxford, says the trial represents a clear vindication for large, long-term trials using clinical endpoints—in contrast to short-term trials relying on surrogate markers such as CD4 counts and viral load—to evaluate anti-AIDS drugs. "We had a fantastic battle to convince people to run the trial for this long," says Peto. Because the Delta trial also collected surrogate-marker data, he predicts that it will be able to serve as a reference for small trials that only measure surrogate markers.

Crustacean Rip Van Winkles

About 330 years ago, around the time an apple fell on Sir Isaac Newton's head, tiny eggs from a freshwater crustacean called *Diaptomus sanguineus* fell to the bottom of a little pond in the colony of Rhode Island. After a 3-century sleep, those very same eggs hatched into healthy larvae under laboratory lights at Cornell University in Ithaca, New York, according to a report in last month's issue of *Ecology*.

The previous record for egg survival of a zooplankton—or possibly any animal species—was a marine crustacean egg about 40 years old, according to biological oceanographer Nancy Marcus of Florida State University in Tallahassee. "We're talking an order of magnitude difference" with the Rhode Island find, she says.



COLLEEN KEARNS

Hardy breed. A female *Diaptomus sanguineus*, 1.3 mm long, with fertilized eggs.

"It's a really cool record. We were amazed," says freshwater biologist Nelson Hairston of Cornell University, who led the egg-hatching team. The eggs hatched 3 years ago, and Hairston and his colleagues estimated their age by radioisotope dating of the sediments in which they were found.

Zooplankton experts already knew that in the summer, when the *Diaptomus*-eating fish population is high, fertilized *Diaptomus* eggs enter a state of suspended animation or diapause until the spring, when the fish population wanes. But they had no idea just how long that diapause could last.

Sadly, the scientists now don't know whether the hatchlings would have led normal lives—the core was sent off for dating after the eggs were hatched. "We didn't realize they were so old, and we had already axed [the hatchlings] by the time we found out," says Hairston. But there are plenty more eggs where those came from. The scientists say there are probably more than 6 billion of varying ages, hidden from light and air, lying unhatched in the pond's bottom.

The protracted diapause—whose mechanism is unknown—may help *Diaptomus* survive major changes in the environment such as an extended drought, says Hairston. Ultimately, it also might help the crustacean weather humanmade threats. Hair-

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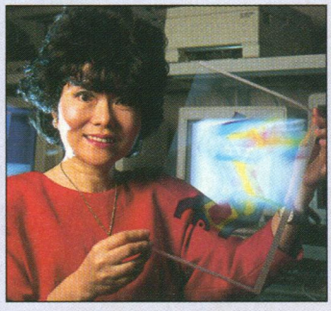
Women at the Top: Eastern Division

Are Japan's women scientists finally getting to the top? Since this spring, three scientific societies have elected women as presidents. A fourth—the Physical Society of Japan, one of Japan's largest and most prestigious scientific groups—will have a woman president next year: Fumiko Yonezawa, a physics professor at Keio University who is internationally recognized for her work on the atomic structure of amorphous materials, became vice president of the physics group last month and will step up to the presidency in September 1996.

The other three new society leaders are physicist Misao Ohi of Tokyo Gakugei University, president of the Spectroscopical Society of Japan; Mizuho Ishida, head of the Seismic Activity Laboratory at the National Institute for Earth Science and Disaster Prevention in Tsukuba, who is president of the Seismological Society of Japan; and Tomoko Kusama, associate professor in the Department of Radiation Health at the University of Tokyo, who is president of the Japan Health Physics Society.



DENNIS B. GRAY/MERCURY PICTURES

Physics first. Yonezawa in her lab at Keio University.

According to Katsuko Saruhashi, a retired geochemist and longtime observer of the progress of women in science, this is the first time Japan's mainstream scientific societies have put women at the helm. In Ohi's view, the recognition was inevitable. "It's just the age where such things are becoming not unusual," she says. Yonezawa points out that the first women to benefit from post–World War II educational opportunities are now established scientists with substantial accomplishments, ready to assume leadership posts.

Nonetheless, women aren't going to be flooding out of the Japanese science pipeline anytime soon. Japanese society still discourages women from pursuing higher education, says Yonezawa. Indeed, even at her university, she says, women make up only 10% of the undergraduate physics majors and less than 5% of the graduate students.

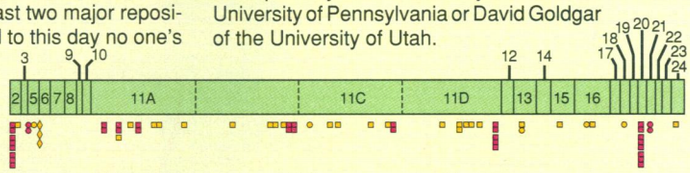
Web Site for Mutation Sites

Breast cancer researchers are setting up their own site on the Internet to keep each other up to the minute on the analyses of the genes linked to the disease.

The new Web site, the Breast Cancer Information Core (BIC), carries a statement from its founders, the International *BRCA* Consortium, explaining that a "central repository" is needed, especially in light of "the poorly coordinated analysis of other cancer susceptibility genes." Stephen Friend of the Fred Hutchinson Cancer Research Center in Seattle, Washington, explains that "*p53* [a major tumor suppressor gene] had at least two major repositories going simultaneously, and to this day no one's figured out the degree of overlap between them."

BIC's address is **http://www.nchgr.nih.gov/dir/lab_transfer/bic/**. Friend says that even at a time when new Web sites are being created at the rate of 1000 a day, "it is still not that common" for a community of researchers to be connected via a site. This one will contain all the mutations and polymorphisms so far found in all the breast cancer susceptibility genes, and information on all proven techniques for analyzing mutations. It will also function as a bulletin board.

Participants in BIC, which will be ready for action on 1 November, must apply for access at the site and will be given passwords. Submissions for posting in the repository will be vetted by Barbara Weber of the University of Pennsylvania or David Goldgar of the University of Utah.



Click on BIC. Web users can click on exons in this *BRCA1* gene map to view specific mutation databases.

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ston's team is now investigating how *Diaptomus* egg banks have fared in Onondaga Lake, in New York, which is severely contaminated with heavy metals.

Diabetes Marker Identified

One of the major proteins that the immune system attacks in insulin-dependent diabetes has been identified, clearing the way for a cheap and simple test for susceptibility to the most severe form of the disease.

Insulin-dependent, or type I, diabetics produce antibodies to many of their own proteins, including insulin. Biochemist Michael Christie from King's College in London and colleagues found several years ago that, in young children, the presence of antibodies to a specific unidentified protein could predict diabetes. Nondiabetics have the protein but not the antibody. But assays for these antibodies were time-consuming and labor-intensive and could only be done on a small scale.

"We now know what the protein is," says Christie. He and his team report in last month's *Journal of Clinical Investigation* that it is a type of tyrosine phosphatase called IA-2 that is found only in insulin-producing islet cells in the pancreas and in the brain. Independent research had already suggested that IA-2, whose sequence structure is documented, was a candidate target for autoimmune attack in diabetics. Now that the mystery protein is identified, large amounts of it can be made artificially and used to screen blood samples for the presence of antibodies. "About 70% of type I diabetics have the IA-2 antibody," says Christie.

The protein's identification "is important conceptually and practically," says immunologist Gian Franco Bottazzo of the Royal London Hospital Medical College. And with a recombinant supply, "we can test hundreds of thousands of samples with an easier type of assay." Jean-François Bach, immunologist at the Necker Hospital in Paris, says that pulling together the research on the hitherto unidentified protein and IA-2 "strengthens [its] importance ... for both predictive testing and pathological studies." Any protein that is a major target for antibodies in diabetics is likely to be implicated in the disease itself, says Christie, so the new finding could also lead to a strategy for preventing the immune response that destroys the pancreas' ability to produce insulin.

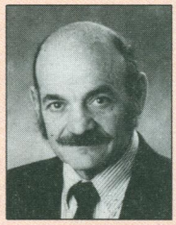
Budding Project At Livermore

Although living in the shadow of the federal budget ax, Lawrence Livermore National Laboratory is pressing on with new civilian-centered concerns by hiring a prominent industrial ecologist to head a brand-new program.

Braden Allenby, research vice president for technology and the environment at AT&T, will spend 2 years at Livermore getting a new industrial ecology program off the ground. Industrial ecology goes far beyond such mundane things as toxic cleanup of industrial wastes. Its purpose, rather, is the redesign of industry as a whole to be environmentally friendly (*Science*, 25 June 1993, p. 1886). Industrial ecology is one of the lab's three main future thrusts, the others being nuclear deterrence and programs in the life sciences.

Such a mission may dwarf the Manhattan Project in its difficulty, but if anyone is up to the challenge, it's Allenby, say those who know him. "He has been one of the central people who has managed to build an intellectual community around industrial ecology," says his Bell Labs colleague Thomas Graedel. Among the projects Allenby eventually would like to see at Livermore: the development of a "materials database" of commonly used industrial materials, ranked for their overall environmental impact. Companies could use it to pick the most benign materials that meet their needs. But at the moment, Allenby's project will cost the government very little, as it will consist of "strategic planning" and brainstorming with Livermore people on possible research projects.

Prize Time



Medalist. Alexander Rich.

As summer wanes, scientific awards season looms, and honors are starting to shower on worthy scientists like autumn leaves. Last week President Clinton announced eight winners of the National Medal of Science, the government's highest scientific honor. They are chemist Thomas Cech of the University of Colorado, physicist Hans Dehmelt of the University of Washington, astrophysicist Peter Goldreich of the California Institute of Technology, chemist and x-ray crystallographer Isabella Karle of the Naval Research Laboratory, mathematician Louis Nirenberg of New York University, psychologist Roger N. Shepard of Stanford University, electrical engineer Hermann Haus of the Massachusetts Institute of Technology, and molecular biologist Alexander Rich of MIT.

The National Medal of Technology, announced by U.S. Commerce Department chief Ron Brown, goes to six winners: Edward R. McCracken, chief of Silicon Graphics in Los Altos, California; Sam B. Williams, head of Williams International of Walled Lake, Michigan; Alejandro Zaffaroni, founder of Alza Corp. in Palo Alto, California; and an IBM team, Praveen Chaudhari, Jerome C. Cuomo, and Richard J. Gambino.

And for engineers, the National Academy of Sciences bestowed the Charles Stark Draper prize, which carries with it $400,000, making it the "world's largest award for engineering achievement." The winners are two communications satellite pioneers: John R. Pierce, 85, who at AT&T designed Telstar 1, and Harold Rosen, 69, who while at Hughes Aircraft developed the first satellite for geosynchronous orbit.

The most spectacular display of awards season, the Nobel Prizes, is due in a few weeks.