

Biomedicine

Joanne Silbener reports from Washington, D.C., at the annual meeting of the American Academy of Allergy and Immunology

Transfer factor and AIDS

In the search for an AIDS treatment, researchers have tried already available agents, designed new chemical entities and rummaged through libraries of drugs shelved because they failed other purposes. Bruce L. Wolf and his colleagues at the University of Tennessee in Memphis tried transfer factor, an as-yet-uncharacterized molecule or molecules contained in white blood cells. While their small pilot study showed it is not likely to be of much help against full-blown AIDS, Wolf says the results indicate transfer factor may be worth investigating as a treatment for AIDS-related complex (ARC), a condition marked by many of the same symptoms as AIDS and which frequently leads to AIDS.

Transfer factor was first isolated in the 1950s and can apparently transfer immunity to infectious diseases from one person to another. The substance has a few fans among researchers who have used it to treat a variety of conditions, including chickenpox and chronic active hepatitis. But perhaps because no one is sure just what it is, transfer factor has never really caught on as a therapeutic agent.

Wolf and his associates collected transfer factor from healthy individuals and injected it into 10 people with AIDS. Because of their immune system suppression, all 10 had previously failed to respond to a test in which skin is exposed to five allergenic substances. After treatment with transfer factor, five of the people developed skin reactions to one or more of the substances.

One other person responded strongly to all of them, but, says Wolf, he "was different to begin with." He started out with more CD4 cells, key immune system cells that are usually severely depleted in people with AIDS. "We feel transfer factor by itself is likely not effective for most patients," Wolf says. But people with ARC have just slightly low CD4 levels, and for them, he says, transfer factor has the potential of being helpful.

The findings support a Feb. 6 JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION report from the Cleveland Clinic describing the development of at least some immune response in six of seven AIDS patients treated with a lower dose of transfer factor than what Wolf and his colleagues used. The Cleveland Clinic researchers collected their transfer factor from healthy individuals and people with antibodies to the AIDS virus and swollen lymph glands, but not AIDS or ARC.

Enzyme ruse successful

A method of protecting a therapeutic enzyme from destruction by the immune system has proven "remarkably successful," says Rebecca H. Buckley of Duke University in Durham, N.C. She and her colleagues used the treatment earlier this year (SN: 5/3/86, p.277) to supply the enzyme, adenosine deaminase (ADA), to two children with severe combined immunodeficiency.

The children had been born without the ability to produce their own ADA. Without ADA, the immune system can't function normally, but it can still destroy foreign ADA.

Buckley and her colleagues used ADA molecules studded with polyethylene glycol (PEG), the main ingredient in antifreeze. The PEG shielded the enzyme from immune system cells, but the smaller molecules on which the enzyme normally acts were able to diffuse through the PEG barrier. The ADA brought back immune function where there had been none, Buckley reported at the meeting and in the March 5 NEW ENGLAND JOURNAL OF MEDICINE.

The only other treatment for ADA deficiency is bone marrow transplantation, for which a matched donor is needed and which is effective in only half the cases treated. The antifreeze protection may work in other enzyme deficiencies as well, Buckley says.

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Science & Society

What a few can do for the environment

Among the more daunting prospects for those charting a course toward an environmentally sustainable future is how to mobilize the world into coordinated action. For some major environmental problems, however, policy changes by just a few important countries could make a substantial contribution. In *State of the World 1987*, a new book by the Washington, D.C.-based Worldwatch Institute, Lester R. Brown and Edward C. Wolf illustrate this potential power of a few to affect the many.

For example, though world population grew by 83 million last year, China (with 18 million) and India (with 11 million) accounted for 35 percent of the increase. On a more regional scale, Egypt's and Nigeria's 26 million births annually represent more than a quarter of Africa's total. Brazil and Mexico account for more than half of Latin America's births.

China has already begun putting the brakes on its population growth. If they are not impeded, that growth could slow to almost zero by the turn of the century. By contrast, India's population is expected to more than double within the next 25 years, surpassing even China's in size. Ironically, though India was the first country to enact an official family-planning program, its current rate of population growth — 2.3 percent annually — still ranks as the 88th highest out of 172 nations.

Similarly, nearly half of all atmospheric increases in carbon dioxide (CO₂) and global warming — caused by fossil-fuel combustion — also appear to result from the actions of a few: the United States, the Soviet Union and China. "Although an effective response by these three giants would not ensure sufficient control over the CO₂ buildup," Brown and Wolf say, "it could enhance greatly the global chance of success." Moreover, they add, how these three exploit coal (they hold two-thirds of the world's known reserves) "will bear heavily on future world climate."

Because tropical rainforests are estimated to contain more than half of all species, continued tropical deforestation threatens what some are predicting will be the greatest destruction of biological diversity in 65 million years (SN: 9/27/86, p.202). Again, the Worldwatch study notes, because just three — Brazil, Indonesia and Zaire — hold at least half of the remaining tropical rainforests, efforts to save species diversity might benefit dramatically by focusing campaigns on these nations.

"The course corrections needed to restore a worldwide improvement in the human condition have no precedent," Brown and Wolf acknowledge. But these examples illustrate, they say, that the potential for initiating substantial change does not necessarily require action by the many, just the most important few.

New lab for interactive videos

Last week the Smithsonian Institution, together with a group of public broadcasting stations and systems, launched what they believe to be the first comprehensive U.S. center for research and development on interactive-video applications. Located at the Smithsonian's National Museum of Natural History in Washington, D.C., this National Demonstration Laboratory for Interactive Video Technologies is open to educators, museum leaders, journalists, legislators and policy analysts with an interest in marrying computers and software to video, audio and graphic information stored on optical disks.

One application the Smithsonian is developing would permit a theme-oriented tour of its holdings: Calling up "airborne," for example, would provide access not only to planes from the Air and Space Museum, but also to birds from the National Zoo, sketches by Audubon from Smithsonian's art galleries, the pterodactyl model (SN: 10/19/87, p.247) at the Air and Space Museum and a survey of insect research at its Panama center.

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