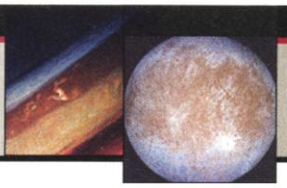

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HIV/AIDS MEETING

Tough Challenges Ahead on Political and Scientific Fronts

BARCELONA, SPAIN—Politics grabbed much of the attention at the XIV International AIDS Conference here last week, which featured demonstrations by angry activists and the participation of more world leaders than had attended the meeting before. But several important research presentations shared the spotlight and helped demolish a long-standing complaint that these gatherings resemble a circus more than a venue to swap cutting-edge data.

The meeting's opening ceremony did feature a circuslike act—Els Comediants, a theater group that included costumed acrobats twirling from ropes hung from the ceiling of the huge Palau St. Jordi. But at the first scientific session the next morning, epidemiologist Bernhard Schwartländer of the World Health Organization (WHO) changed the tone and set the political stage for the weeklong gathering, which attracted 17,000 attendees. HIV, he reported, now infects 40 million people, 94% of whom live in developing countries. Schwartländer described an analysis that he and his co-workers published in the 6 July issue of *The Lancet* that says another 45 million people likely will become infected with HIV by 2010 (see graphic, p. 313).

But Schwartländer stressed that 29 million deaths could be averted if the world steps up its efforts to combat the disease, including offering anti-HIV drugs to everyone in need. "We cannot just accept that millions will be left to die," he said.

Fund and "games." At the center of the drive to treat the world's poor with anti-HIV drugs is the recently created Global Fund to Fight AIDS, Tuberculosis, and Malaria. The Global Fund was the star of the meeting, as people debated how much money it needs, who should provide it, and how the fund should make awards and mesh with existing efforts.

Economist Jeffrey Sachs helped launch the fund with a fire-and-brimstone speech at the last international AIDS conference 2 years ago, calling for expenditures of $10 billion a year to expand the response to HIV/AIDS in poor settings. Last year, Schwartländer and colleagues published an analysis that arrived at a $9.2 billion price tag (*Science*, 29 June 2001, p. 2434). So far, the Global Fund has amassed only about $2.1 billion, and a broad coalition at the Barcelona conference urged the rich nations of the world to contribute much more.

The U.S. government, which has committed $500 million to the fund, took the brunt of the anger. The issue boiled over when U.S. Secretary of Health and Human Services (HHS) Tommy Thompson attempted to speak at one of the meeting's loosely structured lunch sessions, which featured "senior lectures." Activists drowned him out as he stood and read his speech amid blowing whistles and repeated chants of "Shame!"

Sending a message. Protesters drown out HHS Secretary Tommy Thompson's speech at a panel on the Global Fund.

Science has learned that Thompson's staff also caused serious rifts by insisting that conference organizers remove a speaker from his session, Mechai Viravaidya, a senator from Thailand who aggressively promotes condom use. A spokesperson for Thompson says he and his staff wanted the session to focus on the Global Fund, and their request did not reflect a concern that Mechai's message would conflict with the Bush Administration's emphasis on sexual abstinence, as some close to the process charge.

Thompson's prepared speech described the Administration's new $500 million initiative to prevent mother-to-child transmission of HIV in Africa and the Caribbean, both by supplying drugs and by training health-care workers. He also strongly defended the U.S. contribution, noting that his government has pledged "far more than any other nation."

Surrounded by security guards, Thompson walked off stage immediately after reading his text. The Global Fund's executive director, Richard Feachem, spoke next: "I'm really, really glad to be here," he said, prompting laughter and cheers from the crowd. The fund, he said, "needs a massive increase in resources."

Backstage, Thompson told reporters that the U.S. government will "continue to ante up" its contribution to the fund, and he insisted that despite his cold reception, he, too, was glad to be there. He noted that no HHS secretary had "had the courage" to come to the meeting since Louis Sullivan received a similar reception 12 years ago.

At a spirited press conference following the session, Sachs, who now heads the Earth Institute of Columbia University in New York City, decried the fact that no group had yet drawn up an action plan. That lack, he said, complicates critical issues such as how much each country should contribute. Using gross national product as a guide, he said the United States annually should contribute $2.5 billion and another $1 billion in bilateral support, which would have a profound ripple effect. "It is a game," he said. "The United States puts out a marker and other countries match it." Sachs challenged his fellow panelist Peter Piot, head of the Joint United Nations Programme on HIV/AIDS (UNAIDS), to issue an action plan in 90 days when the fund's board meets.

Piot questioned Sachs's analysis. The real challenge, he told *Science*, is for countries seeking help to draft plans that spell out their needs and their capacity to use assistance in an accountable way.

Back to basics. While public health leaders debated the politics of the epidemic, several basic researchers provided a splash of cold water to drug and vaccine developers. Virologist Robert Siliciano of Johns Hopkins University in Baltimore, Maryland, for example, described new insights into HIV's remarkable ability to persist in the body, even in the face of powerful drugs. As he

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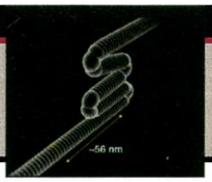
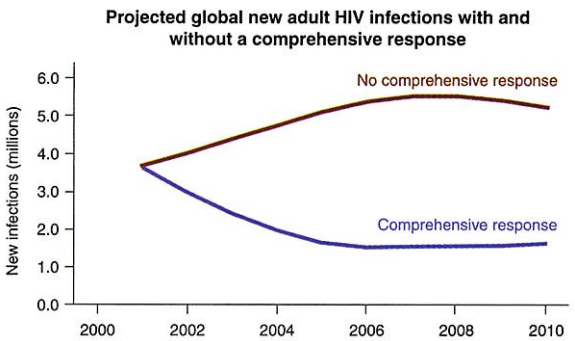


explained, HIV weaves its genes into "memory" cells that allow the body to mount a strong immune response years after infection or successful vaccination. Although these memory cells live only 6 months or so, they occasionally divide. Each time, they pass on their genes—including the passenger HIV. The virus thus can persist without ever replicating. And if it does not copy itself, anti-HIV drugs cannot attack it. "No amount of antiretroviral therapy will ever eliminate this reservoir," said Siliciano, making the disease "intrinsically incurable with antiretroviral therapy alone."



Human savings. A major global initiative could prevent more than 3 million new infections a year by 2010.

More discouraging new data came from three different labs about a phenomenon known as superinfection. Researchers have long taken heart in the observation that people infected with HIV seem able to fend off an infection from a second strain of the virus. This resistance to superinfection suggested that although the immune system cannot clear HIV, it can mount enough "cross-reactive" immunity to thwart new strains, an ability that might hold clues to new vaccine strategies. Several cases of superinfection reported at the meeting have dimmed those hopes.

One case analyzed closely by Bruce Walker of Massachusetts General Hospital in Boston sends an especially discouraging message. Walker described a patient who became superinfected despite having very high levels of anti-HIV killer cells, a key immune actor that many current vaccines aim to elicit. And the second virus came from the same family as the first, which should have made it even easier for killer cells to recognize. "It's terrible news," says Brigitte Autran, an immunologist from Hôpital Pitie-Salpetrière in Paris.

Andreas Meyerhans, a virologist at the University of Homburg in Germany, focused on another disturbing phenomenon: "rampant recombination." HIV-infected people carry many variants of the virus, either as a result of mutations or superinfection. It's long been known that different HIVs can exchange genetic material, giving rise to recombinant variants. But the frequency of recombination, which plays a key role in viral evolution and HIV's ability to dodge drugs or vaccines, has remained a mystery.

By isolating individual HIV-infected cells, Meyerhans and co-workers found evidence of at least two different variants—and as many as eight—a staggering 75% of the time. "It's a really interesting and beautiful study," said Walker. The finding, published in this week's issue of *Nature*, might help solve a long-standing puzzle: why multidrug resistance variants surface so quickly. It also raises serious questions about phylogeny trees that attempt to date the origin of HIV, all of which intentionally discard suspected recombinants to make the data interpretable.

On a brighter note, Ann Sheehy, a postdoctoral student at the University of Pennsylvania in Philadelphia, created much buzz with a discovery about HIV's least understood gene, *vif* (for virion infectivity factor). The Vif protein is believed to suppress an antiviral factor in human cells. Sheehy, working in the lab of virologist Michael Malim (now at King's College London, U.K.), found this long-sought factor, a protein called CEM15. Malim imagines that a drug might derail Vif by binding to CEM15 without affecting the cellular protein's function. "I think it's one of the most important contributions of the last few years," said Mario Stevenson, a prominent virologist at the University of Massachusetts, Worcester.

Power politics. By the time the meeting drew to a close, 10 former or current prime ministers and presidents had shared their views, including former U.S. President Bill Clinton, former South African President Nelson Mandela, Rwandan President Paul Kagame, and Mozambican President Pascoal Mocumbi. "No one can sit on the sidelines," said Clinton, who spoke along with Mandela at the closing ceremony.

Joep Lange, a clinical investigator at the University of Amsterdam who is the new president of the International AIDS Society—the meeting's main organizer—praised the many political leaders for attending. "But let's face it: These are the exceptions," said Lange, who called for a militarylike operation to scale up access to treatment. "Bad government and lack of leadership has actually killed more people than anything else," he said. Six million people today living in poor countries need anti-HIV drugs, but fewer than 2% receive them. "We need to make a plan of action for a concerted global effort," he said. "And yet despite the rhetoric, including the rhetoric about moving beyond the rhetoric, we fail to act."

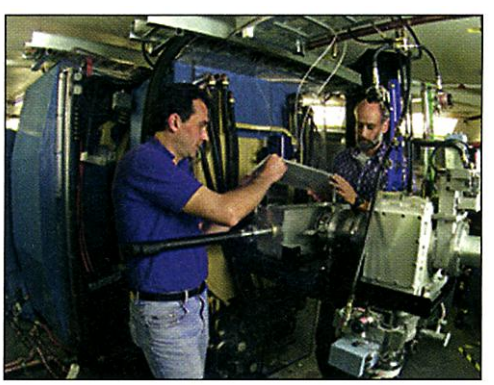
The next international AIDS conference will take place in Bangkok, Thailand, in 2004.

–JON COHEN

HEAVY-ION PHYSICS

Heavy-Element Fizzle Laid to Falsified Data

In 1999, physicists at Lawrence Berkeley National Laboratory (LBNL) in California startled many of their colleagues with an announcement that they had discovered elements 118 and 116 by smashing lead nuclei and krypton nuclei together. Some heavy-ion experts, including Sigurd Hofmann of the Institute for Heavy Ion Research (GSI) in Darmstadt, Germany, thought this "fusion" method of generating superheavy elements was already at its limit, so Hofmann was pleasantly surprised by LBNL's achievement. The surprise, however, turned out to be justified: LBNL has concluded that the "discovery" of elements 118 and 116 was



In happier times. Victor Ninov (left) works on LBNL's element 118 experiment.

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