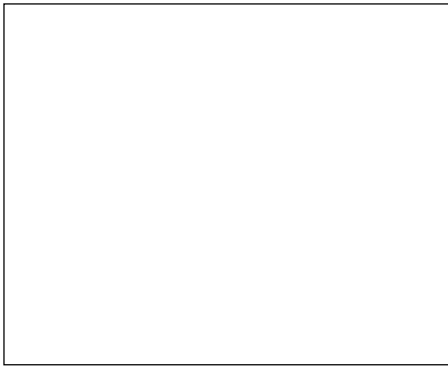


The Duesberg Phenomenon

A Berkeley virologist and his supporters continue to argue that HIV is not the cause of AIDS.
A 3-month investigation by *Science* evaluates their claims

On 28 October, Robert Willner held a press conference at a North Carolina hotel, during which he jabbed his finger with a bloody needle he had just stuck into a man who said he was infected with HIV. Willner is a physician who recently had his medical license revoked in Florida for, among other infractions, claiming to have cured an AIDS patient with ozone infusions. He is also the author of a new book, *Deadly Deception: The Proof that SEX and HIV Absolutely DO NOT CAUSE AIDS*. He insists that jabbing himself with the bloody needle, which he describes as "an act of intelligence," was not meant to sell books. "I'm interested in proving to people that there isn't one shred of scientific evidence that HIV causes any disease," Willner says.



Willner's unsettling self-injection is among the more bizarre manifestations of a phenomenon that many in the AIDS research and treatment community find increasingly troubling: a vocal group of skeptics who continue to grab headlines with their contention that HIV, the retrovirus identified as the cause of AIDS more than a decade ago, doesn't cause the disease. Like almost all "HIV dissenters," Willner relies heavily on the ideas of Peter Duesberg, a retrovirologist at the University of California, Berkeley, who in 1987 published a paper arguing that HIV is harmless. Duesberg has gone on to argue that, rather than HIV, factors such as illicit drug use and AZT, the anti-HIV compound, actually cause the disease. Willner dedicates his book to Duesberg for the California virologist's "courageous exposé of the unconscionable deadly decep-

tion known as the AIDS epidemic."

Although mainstream AIDS researchers dismiss Duesberg's ideas as unsupportable, his challenge to the conventional wisdom is still winning converts. The "Group for the Scientific Reappraisal of the HIV/AIDS Hypothesis," a loose-knit coalition of which Duesberg is a member, has organized an international symposium to be held in Buenos Aires in April. The London *Sunday Times* picked up Duesberg's cause and has run a series of articles questioning HIV's link to AIDS and calling the African AIDS epidemic "a myth."

Kary Mullis, winner of the 1993 Nobel Prize in chemistry for discovering the polymerase chain reaction, has joined in, saying he has seen "no scientific evidence" proving that HIV causes AIDS. In June, the Pacific Division of the American Association for the Advancement of Science (publisher of *Science*) sponsored a daylong meeting at which the dissidents offered their points of view. Duesberg was the guest editor of an entire upcoming issue of the genetics journal *Genetica* that will be devoted to alternative AIDS hypotheses. A recent issue of *Yale Scientific*, which is published by Yale undergraduates in the sciences, carried a cover story by mathematician Serge Lang titled "HIV/AIDS: Have We Been Misled?"

All this controversy confounds AIDS researchers who think HIV has been decisively established as the cause of AIDS. Describing HIV as harmless is "irresponsible, with terribly serious consequences," says Warren Winkelstein Jr., a Berkeley AIDS epidemiologist who has known Duesberg for more than 20 years. Duesberg's message, Winkelstein and others say, undermines the value of campaigns for the use of condoms and clean needles. What is more, says Helene Gayle, associate director of the Centers for Disease Control and Prevention (CDC) office in Washington, D.C., that message is "very damaging" in the attempt to persuade other nations to stem the spread of AIDS, because "people already want to deny" the presence of HIV and AIDS in their countries.

Yet although the scientific community seems concerned about the effects of Duesberg's message, with few exceptions—such as *Nature* editor John Maddox, who took on the London *Sunday Times* for its AIDS coverage—the scientific community has largely ignored Peter Duesberg. But because the Dues-

berg phenomenon has not gone away and may be growing, *Science* decided this was a good time to examine Duesberg's main claims. In a 3-month investigation, *Science* interviewed more than 50 supporters and detractors, examined the AIDS literature, including Duesberg's publications, and carried out correspondence and discussion with Duesberg.

This investigation reveals that although the Berkeley virologist raises provocative questions, few researchers find his basic contention that HIV is not the cause of AIDS persuasive. Mainstream AIDS researchers argue that Duesberg's arguments are constructed by selective reading of the scientific literature, dismissing evidence that contradicts his theses, requiring impossibly definitive proof, and dismissing outright studies marked by inconsequential weaknesses.

The main conclusions of *Science's* investigation are that:

- In hemophiliacs (the group Duesberg acknowledges provides the best test case for the HIV hypothesis) there is abundant evidence that HIV causes disease and death (see p. 1645).
- According to some AIDS researchers, HIV now fulfills the classic postulates of disease causation established by Robert Koch (see p. 1647).
- The AIDS epidemic in Thailand, which Duesberg has cited as confirmation of his theories, seems instead to confirm the role of HIV (see p. 1647).
- AZT and illicit drugs, which Duesberg argues can cause AIDS, don't cause the immune deficiency characteristic of that disease (see p. 1648).

From notable to notorious

Although Duesberg's is the first name that comes to mind when HIV skeptics are mentioned, he was not the first to question the HIV/AIDS connection, as he acknowledges: "I'm generously now credited by lots of people for hypotheses which I'm embarrassed to admit are not my own," says Duesberg. But unlike his predecessors, "Duesberg carries visible credentials," as Robert Gallo of the National Cancer Institute (NCI), whose lab was the first to offer convincing evidence that HIV causes AIDS, puts it. Duesberg is a respected virologist and cancer researcher who in 1985 was awarded a prestigious Outstanding Investigator Grant by the NCI. The next year, Duesberg's colleagues made him a

member of the elite National Academy of Sciences (NAS).

In addition to being an established scientist, Duesberg had another important feature that distinguished him from earlier skeptics of the HIV-AIDS link: scientific combat experience. Duesberg's views about the "AIDS establishment" are strikingly parallel to arguments he first leveled at cancer researchers.

In the early 1970s, Duesberg was among the first to demonstrate the existence of cancer-causing oncogenes by showing that animal viruses of the type called retroviruses carry genes that can transform normal cells in culture into cancerous ones. Ironically, by 1983, Duesberg had turned against the field he helped to found, publishing an eight-page paper in *Nature* savaging the idea that the related proto-oncogenes in normal human cells, once activated, behave like retroviral oncogenes and cause cancer. *Science* ran a similar nine-page Duesberg critique 2 years later.

In 1987, Duesberg upped the ante in a 22-page article in *Cancer Research*. In it, Duesberg argued that the mainstream cancer research community was wrong about retroviruses (the group to which HIV belongs). Some of those viruses, he wrote, which were being thought of as "evil," were, in fact, harmless creatures that were incapable of causing cancer. At first, cancer researchers tried to persuade Duesberg that he was wrong. But soon they began to ignore him. In doing so, they were motivated by two factors. One was the large and growing body of evidence that Duesberg was wrong: Mutations in proto-oncogenes do contribute to some cancers. The second factor was frustration with Duesberg's style, which was widely perceived as inflexible in the face of data that didn't support his views. But because the issue was highly technical and the public health implications indirect, the debate remained in the pages of technical journals.

In the public arena

That wasn't what happened with AIDS. When Duesberg turned his attention to HIV, his objections quickly became a public cause. In the same 1987 *Cancer Research* paper, he made his first strike against the theory that HIV causes AIDS. His conclusion: HIV was nothing more than a benign "passenger virus." Much of the substance of his argument was derived from the fact that there were many unknowns about how HIV causes AIDS—a gap in knowledge that still holds true and still fuels the support Duesberg receives outside the community of AIDS researchers.

Most AIDS researchers thought Duesberg was exploiting uncertainties about the precise mechanism of disease causation to discount a mountain of compelling epidemiologic, laboratory, and animal data supporting the conclusion that HIV causes AIDS. But the press was less skeptical. Steven Epstein, a sociologist of science at the University of California, San Diego (UCSD), who has charted how Duesberg's initial *Can-*

AIDS other than HIV offers an upbeat outlook. "To some extent, going back to the beginning and looking for another cause provides a hope for finding a cure and a vaccine," says Curran.

Duesberg's hero's welcome in the gay community quickly wore out when he began espousing the theory that AIDS was the result of lifestyle choices—in particular, illicit drug use—implying that people with AIDS were in some sense responsible for their disease. But although this message didn't play well in the Castro, says UCSD's Epstein, it did among some political conservatives, including Bryan Ellison, a Berkeley graduate student who became Duesberg's main collaborator; conservative journalist Tom Bethell; and Charles Thomas Jr., a former Harvard University biochemistry professor who has argued that AIDS is a "behavioral" rather than an "infectious" disease.

Epstein cautions that "political configurations in the Duesberg controversy are more complex than simple labels can suggest." Yet he also concludes that "the particular appeal of Duesberg's views to conservatives—certainly including those with little sympathy for the gay movement—cannot be denied."

A willingness to attribute AIDS to specific lifestyle choices wasn't the only reason Duesberg's mes-

sage found receptive audiences outside the scientific community. Another is that his attacks on AIDS researchers as greedy self-interested mythmakers clicked into a growing disenchantment with the medical establishment. Don Des Jarlais of New York's Beth Israel Hospital, who works with users of injectable drugs, suggests Duesberg's theses meet many people's "emotional needs" to make the establishment look bad. "You're not going to argue people out of those [needs] based on footnotes," says Des Jarlais. Harold Jaffe, head of the CDC's Division of HIV/AIDS, also senses disenchantment with the established order. "In the beginning, it may have represented honest scientific argument," says Jaffe. "Now it has assumed some kind of cult status. It's attractive to people who believe the establishment is always wrong. This would be the biggest example of all."

The battle for credibility

Duesberg's followers not only suggest that the "AIDS establishment" is wrong about the cause of the disease; they also argue that mainstream researchers have suppressed Duesberg's search for the truth. The contention of censorship has been given credibility by a half-dozen prominent scientists who

cer Research article wound its way through the media, says "What seems to give this controversy a lot of its motive force and its peculiar twists and turns is the way in which it's enacted in very public arenas."

Through the press, Duesberg found enthusiastic audience for his attack on an "AIDS establishment" that he depicted as pushing a false theory. In Epstein's study, he describes how the *San Francisco Sentinel*, a gay newsweekly, reported that when Duesberg attended an AIDS forum held in the city's largely gay Castro District in January 1988, he "received a hero's welcome."

It isn't difficult to understand why people at high risk of AIDS might be sympathetic to his revisionist views. Not only are there uncertainties about the pathogenesis—the precise way HIV causes disease and death—but also there isn't yet a cure or a vaccine. As virologist Joseph Sodroski of the Dana-Farber Cancer Institute in Boston acknowledges, "the ways for dealing with the virus haven't worked that well. ... Affected people think maybe science, with all its powers, hasn't been able to solve it" because the theory's wrong. AIDS epidemiologist James Curran, who coordinates the CDC's AIDS programs, adds that thinking about causes of

maintain that AIDS researchers have behaved like an establishment, treating Duesberg shabbily for challenging conventional wisdom.

Although AIDS researchers have challenged Duesberg's arguments in scientific journals, public forums, and the media, these rebuttals by and large have been breezy. The consensus strategy has been benign neglect. Duesberg's 76-page AIDS opus published 2 years ago in *Pharmacology and Therapeutics* made nary a ripple in the scientific community. When the mainstream AIDS community does reply, the responses sometimes have an ad hominem edge. In a 1988 *Science* article, Gallo compared Duesberg to "a little dog that won't let go"; Nobel laureate David Baltimore called his ideas "pernicious."

Journals have also had difficulty dealing with Duesberg's unconventional theories. In 1989 and 1991 the *Proceedings of the National Academy of Sciences* subjected his AIDS papers to unusual multilayered peer reviews, although the journal did ultimately publish them. In 1993, NCI decided not to renew his Outstanding Investigator Grant, an act Duesberg claims was politically motivated. NCI officials strongly disagree. "The NCI makes decisions based on scientific merit," says Marvin Kalt, head of NCI's extramural activities. In addition, Duesberg has been turned down by funding agencies on several new proposals to study both AIDS and cancer. Duesberg paints himself as a man paying the price for holding unpopular views. "I would like

to do experiments, but I can't do them anymore because I won't get a grant anymore."

In the eyes of sociologist Epstein, these struggles are largely over a very precious commodity: credibility. "Some of the most powerful weapons available to the defenders of the dominant position in scientific controversies are the sanctions they can exercise against dissidents," Epstein suggests.

But Duesberg has his own resources for sustaining credibility—including some prominent scientists who have circled the wagons around him. In the popular press, these scientists are often cited as Duesberg supporters. But that description overlooks some crucial distinctions. Some of Duesberg's sympathizers strongly support his contention that HIV does not cause AIDS, among them Nobelist Mullis and self-injector Willner.

But others seem equally, if not more, concerned about the treatment Duesberg has received at the hands of the establishment. Former Harvard biochemist Thomas organized the Group for the Scientific Reappraisal of the HIV/AIDS Hypothesis. "When I read his paper in 1987, I came to the conclu-

sion that the evidence [about HIV causing AIDS] was dubious," says Thomas, who studies molecular biology at his own research foundation, Helicon, in San Diego. Just as troublesome, says Thomas, "nobody was coming to his rescue. Everybody turned their backs on him. I figured, hell, if no one else will talk to him, I will. He kind of fell into my arms. He didn't have too many friends in those days."

And some researchers who are frequently cited as Duesberg supporters are not persuaded he's correct about HIV and AIDS—

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—James Curran

but do support his right to dissent and to be taken seriously by the scientific mainstream. Harry Rubin, a Berkeley retrovirologist and member of NAS who shared Duesberg's misgivings in the cancer debate, says he "doesn't deny" that HIV could play a role in AIDS. Rubin even cites a recent paper dismissing the drugs-AIDS hypothesis that he calls "fairly convincing." Yet

Rubin supports Duesberg's right to voice his scientific opinion. "I respect what he's done and what he stands for," says Rubin.

Berkeley's Richard Strohman, a professor emeritus of cell biology, has doubts about HIV's role in AIDS but stops short of endorsing Duesberg's view that it can't cause disease and that drugs and AZT do. Instead, Strohman says his main interest in the debate has been supporting Duesberg's right to dissent. Nobel laureate Walter Gilbert, a Harvard molecular biologist, has taken a similar stance.

Also unpersuaded of Duesberg's ideas—but persuaded he shouldn't be shut out of scientific resources—is Daniel Koshland Jr., editor-in-chief of *Science*, who has written letters to the National Institute on Drug Abuse supporting Duesberg's recent grant proposals. Those proposals focus on animal tests of Duesberg's hypothesis that drugs—in this case, nitrite inhalants like the "poppers" sometimes used by gay men—cause AIDS. "[Duesberg] has been considered far-out because of his insistent denunciation of the general conclusion in regard to AIDS,"

wrote Koshland, who has been critical of his Berkeley colleague for not doing experimental work in AIDS. "But his willingness to do this experiment is important."

But as he's garnered support from those notables, Duesberg has begun losing support from some early allies, including Robert Root-Bernstein, a physiologist at Michigan State University, and New York AIDS clinician Joseph Sonnabend, who both criticize Duesberg for being too inflexible in his assertions that HIV isn't the cause of AIDS.

Whatever the opinions of others, Duesberg says he will persevere—despite personal losses. "The one thing I'm doing here is almost destroying my own reputation by questioning whether HIV is the cause of AIDS." If he had accepted the HIV argument, he says, "I would not have to worry about a grant for a second; the lab would be humming; I would be in the *Journal of AIDS*. ... I would have a tremendous life, and I will see my 30 years of retrovirus work had paid off handsomely after all." He insists that if he read a single scientific article that suggested to him he was wrong, he would alter his views. "I'm looking for that article," he says. "I would love to see it." But for now, nothing he's seen has changed his mind.

—Jon Cohen

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