

REVIEWING THE DATA-II

Fulfilling Koch's Postulates

A century ago, German bacteriologist Robert Koch devised a test for proving that a disease is caused by a specific microbe. That test, known as "Koch's postulates," has become a standard in medicine. Peter Duesberg claims HIV fails it. But some researchers think recent evidence suggests the virus does pass this test.

Koch maintained that for causation to be established, it must be possible to isolate the microbe from an organism that has come down with the disease. The microbe must then be given to a healthy host, where it causes the same disease; then the microbe must be isolated again. Until recently, many AIDS researchers agreed HIV had not satisfied Koch's postulates, largely because there is no good animal model for AIDS. But those researchers did not agree that because HIV didn't satisfy Koch's postulates, it wasn't the cause of AIDS. They pointed out that Koch's postulates have not been satisfied in many other diseases where the cause has been well established by other means.

But recently some leading AIDS researchers have stopped conceding that HIV doesn't satisfy Koch's postulates, as powerful new evidence emerged from tragic accidents: the infection of three laboratory workers with a pure, molecularly cloned strain of HIV. As reported at the 1993 international AIDS conference in Berlin by the National Cancer Institute's William Blattner and his colleagues, one of the three lab workers developed *Pneumocystis pneumonia*, an AIDS-defining disease, 68 months after showing evidence of infection. This lab worker had not received AZT (which Duesberg contends can cause AIDS), or any other anti-HIV drug, until 83 months after infection, when the patient had fewer than 50 CD4 cells, the key immune system cells destroyed by HIV. (A healthy person typically has a count of 600 to 1200 CD4s.)

Blattner reported that a second lab worker, who also received no anti-viral drugs, had 250 to 400 CD4s at 83 months. The third lab worker had CD4 counts of 200 to 500 at 25 months and had been given anti-virals. "These people have no other risk factors" for AIDS, such as illicit drug injection or homosexual sex, Blattner says.

Duesberg told *Science* that, in his view, the lab-worker data don't prove that HIV satisfies Koch's postulates. Two of the lab workers, he notes, did not have AIDS, but only a severe decline in CD4 counts. Duesberg did not directly address data on the one lab worker who has the AIDS-defining illness *Pneumocystis pneumonia* and therefore does have AIDS. Instead, Duesberg responded by asking why, if HIV causes AIDS,

more HIV-positive people don't develop this AIDS-defining pneumonia within 5 years. (The average time between HIV infection and an AIDS-defining illness is 10 years.)

Rather than accept the lab-worker data as definitive, Duesberg said he would like to see an epidemiologic study to answer the question of whether HIV causes AIDS. The study he wants would compare two large groups of people matched for age, lifestyle, and "non-drug use" who differ only in HIV status. "If the HIV-positive group had significantly more AIDS-defining diseases

than the negative group, HIV could be the cause," Duesberg says. But, he says, "there is not even one study in the vast AIDS literature that shows that an HIV-positive group of 20- to 50-year-old people who do not use drugs and do not have congenital diseases, like hemophilia, have more AIDS diseases than an HIV-negative control group."

Others contend that this study isn't necessary. "As far as I'm concerned, the laboratory workers prove causation," says Anthony Fauci, head of the National Institute of Allergy and Infectious Diseases. "I don't need any more than that."

—Jon Cohen

