Briefing:

Lindow Microbe Test Delayed by Legal Action Until Spring

University of California pathologist Steven Lindow's effort to test altered bacteria designed to inhibit the formation of frost on potatoes, strawberries, and other crops has again been scuttled. The Berkeley-based scientist and the university are postponing the test pending the outcome of a new environmental assessment. It is being conducted as part of a court-supervised agreement with a coalition of citizens and environmentalists that contends the university and state failed to comply with the California Environmental Quality Act (CEQA).

After 2 years of delay, Lindow had hoped to finally initiate the experiments with strains of *Pseudomonas syringae* in early August at the university's research center near Tulelake in northern California. The Lindow field test is viewed by the biotechnology industry as a landmark trial that will ease public concern about the hazards of releasing genetically engineered organisms into the environment. Although Lindow had obtained the necessary federal and state permits to enable him to proceed last spring, the university postponed the experiment in the wake of local concerns about its potential effects on the farming community.

In the interim the university sought to convince residents that the experiments are harmless. Reviews conducted by the National Institutes of Health, Environmental Protection Agency, and the Food and Drug Administration have concluded that there is minimal risk since *Pseudomonas syringae* bacteria are commonly found in soils throughout the state. The difference in the Lindow strains is that a gene has been deleted to prevent the secretion of a protein that spurs the formation of ice crystals on plants. The alteration means some crops could be protected for short periods from damaging frosts when temperatures drop to as low as 25°.

Nevertheless, on 6 August, residents of Tulelake, Californians for Responsible Toxics Management, and social activist Jeremy Rifkin obtained a temporary restraining order from the California Superior Court blocking the experiment for 19 days. The plaintiffs asserted that the Department of Food and Agriculture wrongly issued the university a "transportation and use permit" for the bacteria. The agency, they argued, did not consider the state environmental quality act stipulations at the time. Officials of the department's plant industry division told *Science* that at the time they issued the Lindow permit, they were unaware that CEQA applied. The department, which typically screens applications for compliance with federal law, is now developing procedures to assure that the state law is taken into account.

Gary Morrison, an attorney for the University of California, contends that the university has met the letter of the law. Three years ago, Morrison notes, the university ruled that the experiment was not subject to CEQA. No one challenged the university declaration within 180 days as required by state law.

Morrison said the university and Lindow agreed to review and upgrade the existing environmental assessment where necessary to comply with state law because the restraining order threw off the test schedule. Regardless of the outcome of the legal challenge, by the time the isssue was resolved it would have been too late in the summer to initiate the experiment.

Under the negotiated settlement reached 19 August, the university will sit down with the Tulelake citizens and environmentalists to work out what issues need to be addressed in the assessment. Depending on the outcome, a more detailed "environmental impact review" could be required. In any event, says Morrison, Lindow should be able to proceed with his experiment next spring. As part of the agreement, he notes, the plaintiffs have agreed to file any new action in court within 30 days of the environmental review's completion.

It is not clear whether this latest legal wrangle means additional regulatory hurdles for researchers and companies seeking to conduct other tests of genetically altered bacteria and plants in California. Researchers and biotechnology companies have an estimated 15 applications to conduct outdoor experiments pending before the state Department of Food and Agriculture. The counsel for the plaintiffs, however, has asked the state attorney general to freeze these permits and permit applications pending the implementation of procedures by the department to assure that the California Environmental Quality Act is complied with.

Among the companies that could be affected is Advanced Genetic Sciences (AGS). The company's permit was revoked by the Environmental Protection Agency after it was disclosed that frost inhibiting bacteria had been injected into trees atop its Oakland headquarters building without federal approval. AGS hopes to have EPA reinstate its permit to proceed with the field test of its modified version of *Pseudomonas syringae*. Before that can happen, EPA officials say, the company must find an alternative to the proposed Monterey County site. ■

MARK CRAWFORD

PHS Invites Industry Collaboration on AIDS Vaccine

Assistant Secretary for Health Robert Windom recently released a notice* that solicits industry collaboration with the government " . . . for the development, testing, production and distribution of a vaccine for the prevention of acquired immune deficiency syndrome (AIDS)." Essentially, the document identifies the data and facilities that the Public Health Service (PHS) can provide to private industry, lists the patent applications held by the United States government that may be pertinent to vaccine development, and outlines the kind of information that should be included in a proposal to collaborate.

No vaccine for AIDS exists now but several pharmaceutical and biotechnology companies are working to produce one. Many, including Genentech in South San Francisco, Chiron in Emeryville, California, and RepliGen in Cambridge, Massachusetts, have already established vaccine collaborations with government scientists and researchers in university laboratories in the United States and other countries. According to Lowell Harmison, science advisor at PHS, the new PHS framework will "provide a more formal structure to develop collaborative efforts on the part of the public and private sectors."

Because scientists from many different private and government laboratories are already collaborating to develop a vaccine for AIDS, it is not readily apparent what additional opportunities the new PHS notice offers. In its statement, PHS says that it "may provide patent licensing, research results, scientific knowledge, laboratory facilities, animal models and animal testing, assistance in the formulation of clinical protocols and clinical trials, and other (appropriate) assistance" to private concerns that are selected for collaboration. Harmison indicates that by spelling out the variety of government data and services available to potential collaborators, industry may find them more directly accessible.

The PHS notice identifies 15 patent applications as available for licensing under the

*The PHS document "AIDS Vaccine Development: Private Sector/Government Collaborative Efforts" was published in the *Federal Register* 22 August.