Daniel Hoth: *"If it is a wonder drug, it won't take that long to find out. But most drugs aren't home runs. They are singles."*

singles."

Instead, researchers are trying to identify "surrogate end points" that can give them faster information than survival does about whether a drug is working. In fact, selection of surrogate end points will be the first issue tackled by a new panel of government, academic, and industrial drug experts recently established by the Institute of Medicine. Panel members, including Food and Drug Commissioner Frank Young, agreed unanimously to make this their first priority.

Two end points under consideration are the patient's CD4-lymphocyte count and his blood concentration of the p24 antigen of the AIDS virus. The CD4 lymphocyte is one of the major cell types infected by the AIDS virus; a decline in the number of these cells reflects a failing immune system. The p24 antigen concentration is an indicator of AIDS virus reproduction.

The CD4 count presumably would climb, and the p24 antigen concentration fall, in response to an effective AIDS drug. However, questions remain about what these changes might actually mean in terms of benefits for the patient. Says Hoth: "It's not absolutely certain that when the CD4 count gets better that the patient gets better, although it is clear the other way around." Broder suggests that the best approach might be to use several surrogate end points to evaluate drug activities.

With as many as 1.5 million people in the United States now infected with the AIDS virus, finding better drugs and better and faster ways of testing them will remain a high priority with AIDS researchers.

■ JEAN L. MARX

ARCO Solar Sale Raises Concerns Over Potential Technology Export

Could photovoltaics go the same way as VCRs, semiconductors, and stereos—technologies pioneered in the United States but exploited by foreign companies? The concern is being fanned by rumors that ARCO Solar, Inc., the largest U.S. manufacturer of solar cells, is on the block and Japanese and European companies are among the bidders. Whoever buys the company would immediately acquire 15% of the world market for photovoltaics and a lot of state-of-the-art technology.

ARCO Solar President Charles Gay declines to identify any of the bidders, but he says that the parent corporation "is interested in seeing the business stay healthy" and is looking for a buyer with strong financial resources. The petroleum company is reportedly talking with Showa Shell Sekiyu, K.K., of Japan, Siemens Solar GmbH of West Germany, a Swiss consortium, and several U.S. investor groups. ARCO expects to select a buyer this summer.

ARCO Solar produces two forms of photovoltaic cells, which convert sunlight into electricity to operate anything from pocket calculators to refrigerators. The company is producing crystalline cells that are used for supplying large power needs, but the electricity from these devices is costly compared to conventional power supplies in the United States. Also in production is a line of less powerful and less costly cells made with thin films of silicon applied to architectural glass. A second high-power thin-film solar cell line with copper-indium-diselenide (CIS) chemistry is nearing production.

These cells, which make electricity nearly as efficiently as single crystalline cells, one day could compete with conventional power stations if manufacturing costs can be lowered sufficiently. The company's total sales last year are estimated by industry analysts to be around $25 million. One industry analyst says ARCO Solar could go for around $30 million.

Of particular concern is the potential export of the company's expertise in CIS cells. ARCO has been a leader in this technology, thanks in part to financial help from the Department of Energy. Says Robert Annan, director of photovoltaics technology for the department: "That is an American technology. DOE has supported it all the way along." ARCO does not, however, have a monopoly on the technology. Boeing Electronics and Chronar Corporation are also pursuing CIS with DOE assistance. Should a foreign competitor acquire ARCO Solar, Annan adds, it would get access to the technology just as it is about to hit the market.

ARCO Solar is "basically several years ahead of any competition [in CIS]," says Thomas Surek, manager of the photovoltaics program at the Solar Energy Research Institute in Colorado. Europe and Japan are just starting CIS research, he says, and will likely take 4 to 5 years to develop it.

The fears about export of technology are heightened by the fact that the U.S. photovoltaics industry is already facing stiff foreign competition. Over the past 10 years, in fact, U.S. manufacturers have seen their share of the world market cut from 80% to about 40%.

These arguments have struck a chord in Congress. Representative Vic Fazio (D–CA) and Senator Tim Wirth (D–CO), have both expressed concern about the potential sale. And the Commerce and Defense departments already have been alerted to the possibility of a foreign takeover and may require the sale to be approved by the Committee for Foreign Investment in the United States. The multiagency federal review panel was created as part of last year's trade bill to look at national security issues connected with the sale of high-technology companies to overseas owners.

But Gay contends that the technology transfer issue is overblown. "It has become an emotional lightning rod for some folks," says Gay, noting much knowledge transfer already has occurred at the basic research level. "This is an international business," notes Gay. "Some of the very best science in this area is being done in Japan and Europe." Stanford Ovshinsky, president of Michigan-based Energy Conversion Devices, Inc., agrees. "There is nothing that ARCO solar has that is not available to other technology companies," argues Ovshinsky, who has been a pioneer in the use of amorphous silicon for photovoltaics and in other electronic applications.

Nevertheless, John Corsi, president of Solarex Corporation, says it is hard to conclude that a foreign purchaser will not reap some benefit in buying ARCO Solar. Adds Roger Little, president of Spire Corporation, a supplier of photovoltaic manufacturing equipment, "it would be a big mistake" to export key technology, especially when the U.S. industry is already under such pressure.

■ MARK CRAWFORD